

77 01480

MANAGEMENT SURVEY
OF
COUNTY AMBULANCE SERVICES

LOS ANGELES COUNTY
1975-1976

VOLUME I
ANALYSIS AND RECOMMENDATIONS

INSTITUTE OF GOVERNMENTAL
STUDIES LIBRARY

FEB. 7 1977

UNIVERSITY OF CALIFORNIA

TOUCHE ROSS & CO.



77 01480

TOUCHE ROSS & CO.

3700 WILSHIRE BOULEVARD
LOS ANGELES, CALIFORNIA 90010

June 30, 1976

[LA Co. Chief admin. officer]
Ambulance service LA Co.

Mr. Harry L. Hufford
Chief Administrative Officer
County of Los Angeles
500 West Temple Street
Los Angeles, California 90012

Dear Mr. Hufford:

This document is the final report of the Management Survey of County Ambulance Services. The survey was commissioned by the Los Angeles County Board of Supervisors in December 1974 to evaluate emergency ambulance services in Los Angeles County. Request for Proposal 74-3 stated the objectives of the survey:

- Evaluate ambulance services currently paid for by the County
- Study alternative approaches for meeting countywide obligations to provide adequate field emergency medical services in both incorporated and unincorporated areas

Proposals to perform the survey were submitted by several consulting firms in January 1975, and Touche Ross & Co. was selected. A contract was signed in October 1975, and work commenced soon thereafter. The project team included Touche Ross & Co. consulting and accounting personnel, as well as consulting subcontractors: Dr. Ronald L. Krome, President Elect of the American College of Emergency Physicians, and John M. Waters, Director of the Department of Public Safety, Jacksonville, Florida.

Mr. Robert Eskanos, Principal Administrative Analyst in your office, served as the County's Project Director. In order to assist Mr. Eskanos, a Project Steering Committee was appointed to review material, resolve difficulties, and provide direction

77 01480

INSTITUTE OF GOVERNMENTAL STUDIES LIBRARY
109 PHILOSOPHY HALL
UNIVERSITY OF CALIFORNIA
BERKELEY, CA 94720

Mr. Harry L. Hufford
June 30, 1976
Page Two

to the project team. The Project Steering Committee, which met every two to four weeks during the course of the survey, consisted of knowledgeable representatives from County departments, independent cities, and private ambulance companies.

The scope of the survey was limited to the major components of field emergency medical services in the County of Los Angeles: the reporting of an incident, the response to the scene, treatment at the scene, and patient transportation. Treatment in hospital emergency rooms and subsequent follow-up care were excluded. The scope of the survey was summarized by the County as follows:

- Identification and quantification of field emergency medical services provided by the County and by public agencies and private companies within the County
- Evaluation of the efficiency and effectiveness of the field emergency medical services currently being provided
- Development of recommendations, supported by cost data, to assist the Board of Supervisors in determining the most effective countywide organization to meet the County's field emergency medical service needs
- Definition of the role, responsibilities, and structure of County management in the operation of the recommended countywide organization

To fulfill the objectives of the survey, more than 160 key individuals were interviewed. In addition, financial and operational reviews were conducted of sixty-four of the providers of field emergency medical services in the County. At the completion of the review and analysis of each provider, a summary of pertinent information was prepared and returned to the provider for review and comment. Each provider's comments were resolved before the data describing its operations was included in this report.

The data presented in this report was gathered between November 1975 and April 1976. Annualized financial and statistical data, except as otherwise indicated, represents

Mr. Harry L. Hufford
June 30, 1976
Page Three

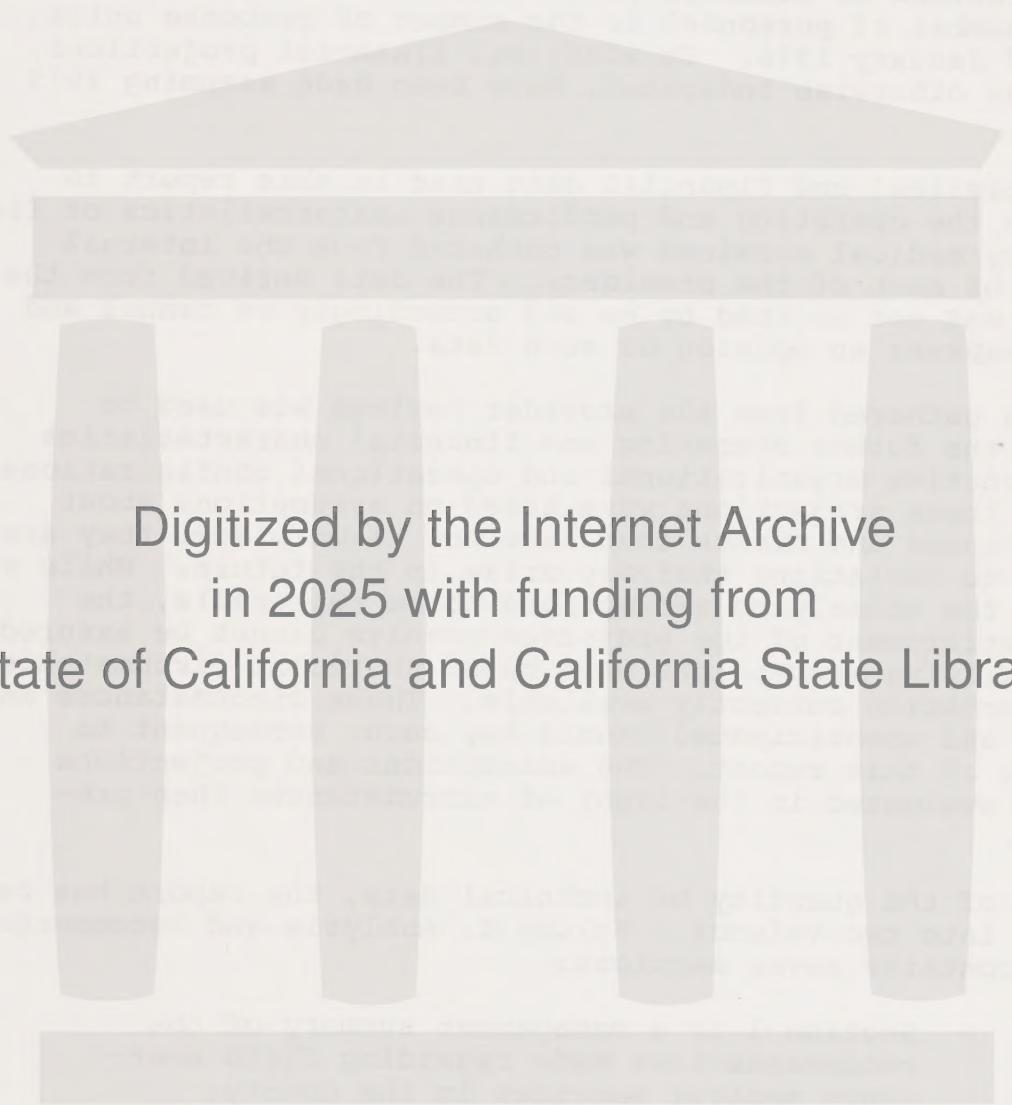
the operations of calendar year 1975. Inventory data, such as the number of personnel or the number of response units, is as of January 1976. In addition, financial projections, except as otherwise indicated, have been made assuming 1975 prices.

The statistical and financial data used in this report to describe the operating and performance characteristics of field emergency medical services was gathered from the internal records of each of the providers. The data derived from the records was not audited by us and accordingly we cannot and do not express an opinion on such data.

The data gathered from the provider reviews was used to project the future operating and financial characteristics of alternative organizational and operational configurations. Because these projections were based on assumptions about circumstances and events that have not taken place, they are subject to variations that may arise in the future. While we believe the underlying assumptions to be reasonable, the actual attainment of the projected results cannot be assured. The underlying assumptions were based on recent circumstances and information currently available. These circumstances may change, and unanticipated events may occur subsequent to the date of this report. The assumptions and projections must be evaluated in the light of circumstances then prevailing.

Because of the quantity of technical data, the report has been divided into two volumes. Volume I, Analysis and Recommendations, contains seven sections:

- Section 1 is a management summary of the recommendations made regarding field emergency medical services in the County.
- Section 2 provides an introduction to emergency medical services in the County and presents the approach used in the survey.
- Sections 3 through 6 contain detailed technical analyses and discussions of current operations, demand for service, resource requirements, system costs, and private ambulance operations.



Digitized by the Internet Archive
in 2025 with funding from
State of California and California State Library

<https://archive.org/details/C123318956>

Mr. Harry L. Hufford
June 30, 1976
Page Four

- Section 7 contains observations and recommendations for the improvement of present and future operations.

Volume II, Technical Appendices, contains technical discussions of the analytical methods employed in the survey and detailed descriptions of each of the field emergency medical services providers in the County. Because of the amount of material contained in the Technical Appendices, their distribution has been limited. A complete copy, however, has been placed on file in your office.

The survey could not have been completed without the cooperation of numerous individuals who devoted considerable time and effort during interviews, data collection, and reviews. We acknowledge and appreciate their assistance.

Very truly yours,

Touche Ross & Co.

TABLE OF CONTENTS

	<u>Page</u>
<u>SECTION 1</u>	<u>MANAGEMENT SUMMARY</u>
- Introduction	1.1
- Long-Term Recommendations	1.1
. Overall Organization and Operation of Emergency Medical Services by 1980	1.2
. Implementation Planning and Coordination	1.2
. Implementation Role of the County of Los Angeles	1.2
- Shorter-Term Recommendations	1.3
. Standards	1.3
. Operational Improvements	1.4
. Administrative Improvements	1.5
. Control of Quality	1.7
. Emergency Aid Program	1.8
. Interfacility Transport and Patient Overflow Program	1.9
. Patient Transportation by County Fire Department	1.10
 <u>SECTION 2</u>	 <u>INTRODUCTION</u>
- Emergency Medical Incident	2.1
- Survey Background	2.2
- Scope of the Survey	2.3
- End Products Required	2.3
- Approach	2.4
. Data Collection	2.4
. Costs	2.5

TABLE OF CONTENTS

	<u>Page</u>
. Resource Allocation	2.5
. Private Ambulance Company Review	2.6
- Definition of Terms	2.6
. General	2.6
. Personnel Classifications	2.7
. Sequence of Events	2.8
 <u>SECTION 3</u>	
<u>CURRENT PROVIDER OPERATIONS</u>	
- County Characteristics	3.1
- EMS Providers	3.1
. Primary Jurisdictional Providers	3.2
. Response Unit Locations	3.3
. Types of Delivery Systems	3.4
- 1975 Performance Data	3.8
 <u>SECTION 4</u>	
<u>PROJECTED EMS DEMAND AND RESOURCE REQUIREMENTS</u>	
- 1980 EMS Demand and Resource Methodology	4.1
- Current Demand	4.2
- Coordinating Council 1980 Demand Projection	4.2
- Touche Ross Projected EMS Demand	4.3
- Factors Affecting Resource Allocation	4.6
- 1980 Resource Requirements	4.9
. Uniform, Countywide System	4.9
. Continuation of the Current System	4.11

TABLE OF CONTENTS

	<u>Page</u>
<u>SECTION 5</u>	
<u>SYSTEM COSTS AND COST-EFFECTIVENESS</u>	
- Cost Methodology	5.1
- Current System Field Transport Cost	5.4
- Cost Analysis by Type of System	5.5
. Comparison of Systems 4 and 6	5.5
. Systems Using Private Ambulance Companies as Primary Providers	5.6
. Cost Comparisons Between Current Systems	5.7
. Cost Per Run - Variation With Volume	5.7
- Projected 1980 Costs	5.9
. Costs Assuming a Continuation of Existing Systems	5.9
. Impact of Inflation	5.10
- Cost of a Uniform, Countywide System	5.11
 <u>SECTION 6</u>	
<u>PRIVATE AMBULANCE COMPANY OPERATIONS</u>	
- Introduction	6.1
- Review Methodology	6.2
- Operational and Organizational Profile	6.4
. Response Locations	6.4
. Response Vehicles	6.4
. Vehicle Utilization	6.5
. Response Times	6.5
. Service Times	6.5

TABLE OF CONTENTS

	<u>Page</u>
. Emergency Personnel	6.6
- Cost and Revenue Characteristics	6.6
. Rate and Revenue Structure	6.6
. Cost Structure	6.8
. Profitability Structure	6.8
 <u>SECTION 7</u>	
<u>OBSERVATIONS AND RECOMMENDATIONS</u>	
- Introduction	7.1
- Overall Organization and Operation of Emergency Medical Services by 1980	7.1
. Emergency Medical Services in 1975	7.1
. Emergency Medical Services in 1980	7.2
- Implementation of a Uniform, Countywide System	7.3
. Overall Organizational Alternatives	7.3
. Organizational Features	7.7
. Implementation Considerations	7.8
. Implementation Planning and Coordi- nation	7.10
- Implementation Role of the County of Los Angeles	7.13
- Shorter-Term Recommendations	7.14
. Standards	7.14
. Operational Improvements	7.18
. Administrative Improvements	7.27
. Control of Quality	7.34
. Emergency Aid Program	7.37

TABLE OF CONTENTS

	<u>Page</u>
. Interfacility Transport and Patient Overflow Program	7.42
. Patient Transportation by County Fire Department	7.44

LIST OF EXHIBITS

	<u>Page</u>
Exhibit 2-A - Emergency Medical Incident Response General Description	2.10
Exhibit 2-B - Governmental and Other Entities With a Role Relating to Los Angeles County Emergency Medical Services Field Opera- tions or Transport	2.11
Exhibit 2-C - Governmental and Other Entities With a Role Relating to Los Angeles County Emergency Medical Services Field Operations or Transport	2.15
Exhibit 2-D - Governmental and Other Entities With a Role Relating to Los Angeles County Emergency Medical Services Field Operations or Transport	2.18
Exhibit 2-E - EMS Providers Reviewed	2.20
Exhibit 2-F - Time Sequence of Events	2.21
Exhibit 3-A - Los Angeles County	3.9
Exhibit 3-B - Los Angeles County Topography	3.10
Exhibit 3-C - Los Angeles County Population Density	3.11
Exhibit 3-D - Unincorporated Areas in Los Angeles County	3.12
Exhibit 3-E - EMS Operating Characteristics Providers and Personnel	3.13
Exhibit 3-F - EMS Operating Characteristics Vehicles and Operations	3.18
Exhibit 3-G - Emergency Medical Services - Response Locations	3.23
Exhibit 3-H - Emergency Medical Services - Response Locations	3.24
Exhibit 3-I - Summary Description of EMS Delivery Systems	3.25
Exhibit 3-J - EMS Delivery Systems - Operational Summary	3.27

LIST OF EXHIBITS (Cont'd)

	<u>Page</u>
Exhibit 3-K - Distribution of Response Times for all EMS Runs in Los Angeles County	3.30
Exhibit 3-L - Distribution of Service Times for all EMS Runs in Los Angeles County	3.31
Exhibit 3-M - Los Angeles City Fire Department Rescue Ambulance Service - Operating Characteristics - Distribution of Response Times for Rescue Ambulance Companies	3.32
Exhibit 3-N - Summary of Los Angeles City Fire Department Battalion Statistics	3.33
Exhibit 3-O - Los Angeles County Fire Department Emergency Medical Services - Rescue Operations - Squad Response Time Distribution for all Dispatch Areas	3.34
Exhibit 3-P - Los Angeles County Fire Department Emergency Medical Services - Rescue Operations - Squad Response Time Dis- tribution by Dispatch Area (EMS only)	3.35
Exhibit 3-Q - Los Angeles County Fire Department Emergency Medical Services - Rescue Operations - Squad Response Time Dis- tribution by Dispatch Area (EMS and Fire Responses)	3.36
Exhibit 4-A - Los Angeles County - 1975 EMS Demand	4.12
Exhibit 4-B - Los Angeles County Population Density	4.13
Exhibit 4-C - Emergency Medical Incident Rate in Selected U. S. Cities	4.14
Exhibit 4-D - EMS Incident Volume	4.15
Exhibit 4-E - 1980 System Performance Characteris- tics - 450,000 Incidents/Year (Five Minute Average Response Time)	4.16
Exhibit 4-F - 1980 System Performance Characteris- tics - 450,000 Incidents/Year Average Response Times Using 100 Units)	4.17
Exhibit 4-G - Detailed System Performance Data	4.18

LIST OF EXHIBITS (Cont'd)

	<u>Page</u>
Exhibit 5-A - Summary of Current Countywide Annual Costs of EMS Operations	5.14
Exhibit 5-B - Cost Elements as a Percent of Total Countywide System Cost	5.15
Exhibit 5-C - Summary of Current Annualized Tax Base and Total System Cost	5.16
Exhibit 5-D - Net Current Costs by System	5.17
Exhibit 5-E - Comparison of System 4 and System 6 Cost Components	5.18
Exhibit 5-F - Summary of Current Net Cost Per Run and Cost Per Unit by Delivery System	5.19
Exhibit 5-G - Variation of Cost Per Run With Increased Volume	5.20
Exhibit 5-H - Variation of Allocated Cost Per Run With Volume	5.21
Exhibit 5-I - Extension of the Existing System 1980 EMS Cost	5.22
Exhibit 5-J - Projected 1980 Net Costs by System	5.23
Exhibit 6-A - Private Ambulance Operations Profile	6.10
Exhibit 6-B - Private Ambulance Companies EAP and Overflow Revenue Profile	6.11
Exhibit 7-A - Organization of Major Functional Areas	7.49
Exhibit 7-B - General Implementation Timetable	7.52
Exhibit 7-C - General Implementation Workplan	7.53
Exhibit 7-D - Apparent Control of Provider Operations	7.54
Exhibit 7-E - Actual Control of Provider Operations	7.55
Exhibit 7-F - Sample EMS Incident Form	7.56
Exhibit 7-G - EAP Savings for Reimbursement at Less Than Full Rates	7.57
Exhibit 7-H - EAP Medi-Cal Billing Analysis	7.58
Exhibit 7-I - Los Angeles County Fire Department Transport Cost Impact	7.59

SECTION 1

MANAGEMENT SUMMARY

INTRODUCTION

This section provides a brief overview of the survey recommendations. The findings of the survey are offered in an abbreviated form to provide a general background for the recommendations. The terminology used in this section is explained throughout the body of the survey; specific definitions are contained in Section 2. A more complete discussion of the rationale underlying each recommendation presented in this section, as well as an approach to implementation, where appropriate, is contained in Section 7.

LONG-TERM RECOMMENDATIONS

There are currently forty primary jurisdictional providers of field emergency medical services in the County. Each of these providers has responsibility for servicing emergency medical incidents within limited jurisdictional boundaries and does so at service levels which are typically quite high. Service delivery methods employed by the major providers in the County are generally compatible with the area and the demand that they service and result in operations which are relatively cost-effective.

There is no single agency in the County with the authority to manage and control the delivery of services countywide. Because management and control are largely divided among each of the providers, numerous organizational, operational, and jurisdictional problems have developed. The service is currently reasonably effective, however, because lives are at stake and because emergency medical services are provided by well-run public and private agencies.

The County is experiencing a rapid growth in field emergency medical services demand. By 1980 the increased number of emergency incidents in the County will cause the majority of the primary providers to become less cost-effective because their relatively small service areas will contribute to an increasingly inefficient allocation of resources. In addition, as emergency medical services activity increases in the County, current organizational, operational, and jurisdictional problems will be magnified.

By 1980 a uniform emergency medical services system would become cost-effective on a countywide basis. The number of response units required to service the emergency incident

volume, and the resulting cost, would be lower than a continuation of the current method of operation. A uniform, countywide system would also be easier to manage and control, and problems would be more easily resolved.

The implementation of a uniform, countywide system could be achieved through a number of alternative organizational structures and funding arrangements. The most feasible organizational alternative would appear to be the establishment of a joint powers authority. The most feasible funding alternative would appear to be a pro-rata sharing of costs by each of the jurisdictions in the County. However, the final selection of both an organizational and funding alternative should not be attempted until a number of implementation planning activities are completed.

Several complex issues must be resolved during the implementation planning process, and the process itself must be managed and controlled. Because of the extent of the County's current involvement in emergency medical services and the need for a focal point for the management and control of the implementation process, the County of Los Angeles should assume a major role in the implementation planning for the uniform system.

Overall Organization and Operation of Emergency Medical Services by 1980

A uniform, countywide system for providing emergency medical services should be established in Los Angeles County by 1980.

Implementation Planning and Coordination

A broadly based planning group should be established to manage and control the implementation of the uniform countywide system and the shorter-term opportunities for improvement.

Implementation Role of the County of Los Angeles

The County of Los Angeles should assume a major role in the planning and implementation of the uniform, countywide system.

SHORTER-TERM RECOMMENDATIONS

The results of the survey indicate that a uniform, countywide system should be implemented by 1980. In addition, as the current operations were reviewed and analyzed, a number of opportunities for shorter-term improvements were identified. These included improvements in performance and management control, reductions in operating costs, and increases in service levels. The implementation of these shorter-term improvements will provide a double benefit. In addition to enhancing the current operation, these improvements will facilitate the implementation of the uniform, countywide system.

Standards

Definition of Terms:

Standard definitions of terms should be developed and incorporated into forms, contracts, and procedures relating to emergency medical services.

Operating Standards and Procedures:

The Emergency Medical Care Committee, the County Department of Health Services, and the EMS providers should work together to establish guidelines for more uniform standards and procedures for EMS activities countywide.

Development of Standards and Procedures:

Formal procedures should be established that require broad participation in the standards and procedures development process.

Response Time Standards:

Comprehensive standards specifying response performance by EMS providers should be developed and implemented countywide.

Base Station Communication and Operating Procedures:

Formal standards which specify minimum staffing requirements and acceptable operating procedures for base station hospital communications and operations should be developed and enforced.

Operational Improvements

Supervision of Field Activities:

All providers should implement field supervisory positions.

Utilization of Paramedics by Primary Providers:

All primary response units in the County should be staffed with paramedics and equipped with standard paramedic-related equipment and supplies.

Flexible Response Patterns:

Providers should develop flexible response patterns to fit local operating requirements in their service areas.

Mutual and Automatic Aid:

Each EMS provider in the County should implement agreements with neighboring EMS providers to routinely respond to requests for service along jurisdictional boundaries and to provide backup response capability.

Variable Staffing:

To improve cost-effectiveness and at the same time achieve an adequate service level throughout the day, providers should implement variable staffing where it is feasible.

Screening of Requests for Emergency Medical Services:

Procedures for the screening of requests for emergency medical services should be developed, tested in parallel and implemented countywide.

Dispatching of Engine Companies:

Provider procedures should be changed to limit the dispatch of engine companies to those incidents where they can respond significantly faster than the primary response unit, or where additional manpower is needed at the scene.

Dispatch of Private Ambulance Companies:

The County Fire Department should implement the capability to contact private ambulance companies directly.

Base Station Communications Systems:

The new base station communications system design should be finalized and implemented.

Patient Transport to the Closest Qualified Facility:

A uniform, countywide policy should be developed for transport to the closest, qualified emergency facility.

Use of Helicopters:

Procedures should be developed for coordinating the use of County helicopters for emergency medical services.

Administrative Improvements

Certification and Control of Providers:

The County Department of Health Services should develop and implement procedures to certify, decertify, and recertify providers as part of an overall provider regulation program.

EMS Personnel Certification:

Procedures should be developed and implemented for the certification, recertification, and decertification of paramedic and EMT I personnel.

Regulation of EMT I Personnel:

The management and control of emergency medical services should be expanded to include EMT I-level personnel.

Private Ambulance Company Rates:

The County should develop a formal and rigorous rate-setting procedure so that ambulance company rates consider industry costs and profitability guidelines. Costs should be determined through a periodic examination of selectively audited financial data from a representative number of companies.

Determination of the Closest Qualified Emergency Facility:

A hospital categorization study should be conducted by the Department of Health Services to assess the capabilities of facilities; a procedure for data collection should be established to assist in updating the information and for use in contract renewal.

EMS Incident Form:

A comprehensive countywide reporting form should be developed to replace existing forms currently in use, and its use should be required for all providers and for all emergency medical incidents.

Management and Statistical Information:

A comprehensive reporting system should be developed to provide management and statistical

information describing the resource inventory, activity and performance levels of emergency medical services countywide.

Public Education:

The agencies and associations involved in public education should establish an ad hoc committee to develop policies and procedures for coordinating and maximizing the effect of public educational resources countywide.

Public Training:

To maximize the effect of limited training resources, CPR training should be coordinated with public educational programs and directed toward high risk populations and to those areas where alternative emergency resources are not readily available.

Control of Quality

Maintenance of Field Personnel Proficiency:

Providers should establish policies to maintain field personnel proficiency by rotation of personnel between low and high volume response units.

County training and certification personnel should monitor the incident volume and the types of skills used by paramedic and EMT I personnel for use in recertification and training programs.

Field Quality Control Reviews:

Formal and uniform quality control review procedures should be established.

Quality Control Reviews of Larger Providers:

Larger providers should be encouraged to implement their own internal quality control reviews.

City of Los Angeles Quality Control Reviews:

The Los Angeles City Fire Department and the Emergency Medical Systems Division should develop mutually acceptable procedures for reviewing the quality of field performance in the City of Los Angeles.

EMT I Performance Reviews:

Criteria and formal procedures should be developed for reviewing the quality of the performance of EMT I personnel.

Emergency Aid Program

Emergency Aid Program Payments and Billing:

Private ambulance company reimbursement under the Emergency Aid Program should be changed to a flat monthly rate with periodic adjustments.

EAP Contract Changes:

Emergency Aid Program contracts should be reviewed to remove inconsistent language and to add provisions clarifying and broadening the scope of the County's financial and operational audit right.

EAP Authorizing Agencies:

Law enforcement agencies should be replaced by primary EMS providers as the agencies responsible for EAP authorization.

EAP Tickets:

The EAP ticket should be eliminated by

incorporating the information needed for EAP purposes onto a uniform, countywide incident form.

Discounts on Late EAP Payments:

Late-paying patients in unincorporated areas should be billed by the County at the same rate at which they were charged by the ambulance companies. An additional collection charge should be added to offset collection costs.

Hospital Reimbursement:

To realize a potential savings of approximately \$500,000 per year, a mechanism should be established to reimburse hospitals for emergency and inpatient services to EAP-eligible patients at rates more comparable to the cost of providing the services.

Hospital Charges for Medi-Cal Eligible Patients:

To realize a potential savings of approximately \$1,000,000 per year, procedures should be implemented to bill Medi-Cal for EAP hospital charges for emergency services to patients subsequently enrolled in Medi-Cal.

Interfacility Transport and Patient Overflow Program

A comprehensive operational audit should be conducted to determine the volume and actual costs of the current program.

Minimum acceptable patient transportation service levels should be defined and their impact, if any, on the cost of the program should be determined.

The County should obtain bids from ambulance companies to determine the cost if the program were performed by a private contractor.

Patient Transportation by County Fire Department

The County Fire Department should acquire patient transport capability. Prior to this change, the County, with input from the Fire Department and other appropriate agencies, should determine the conditions under which the Fire Department should transport, the maximum acceptable impact on the private ambulance industry, and whether a charge may be instituted in incorporated areas and the proper disposition of the revenue generated by such a charge.

SECTION 2

INTRODUCTION

EMERGENCY MEDICAL INCIDENT

A response to a request for field emergency medical services can involve numerous public and private agencies, a variety of personnel with different types and levels of training, and a number of vehicles, including rescue ambulances, fire engines, police patrol cars, and helicopters. A general description of a response to an emergency medical incident is presented graphically in Exhibit 2-A on page 2.10.

An emergency medical incident begins with the onset of symptoms or the occurrence of an injury. The response process, however, is not set in motion until the incident is reported to the emergency services provider. The report may be initiated by the victim himself, a member of his family, a neighbor, or a passerby. The report may also be made by public agency representatives, such as the police, lifeguards, or park patrol personnel. Communication devices used to report an emergency medical incident include street call boxes, radios, and telephones.

The request for services is usually received by a vehicle dispatcher or a specially trained operator. When the call is received, a description of the incident and its location is entered onto a dispatch ticket. The dispatcher selects the response unit that is available and closest to the scene and determines the number and type of assist units that are required, if any. The response and assist units are notified, either in the field or in quarters, of the nature and location of the incident.

The response unit is typically staffed with medically trained personnel and carries special medical supplies and equipment. The response unit may be an ambulance, a rescue squad truck, or a fire engine and it may or may not have the ability to transport a patient. Assist units are often dispatched when the reported incident requires additional manpower or when special skills, such as fire suppression or traffic control are required. Accordingly, the assist units may be dispatched from a number of agencies, including police and fire.

Depending upon the medical nature of the incident and the training level of the response personnel, medical intervention may be attempted at the scene. If the victim's condition

warrants the use of defibrillation, intravenous techniques, or the administration of drugs, appropriately trained response personnel will contact an authorized hospital. The hospital will electronically monitor the patient's condition and give instructions regarding the proper medical treatment.

The majority of emergency victims require transport to a hospital. If the response unit does not have transport capability, a private ambulance will be either dispatched simultaneously with the response unit or requested from the scene, if required. The emergency medical incident ends with either the treatment and release of the victim at the scene or the delivery of the victim to a hospital emergency facility.

SURVEY BACKGROUND

The demand for field emergency medical services has increased significantly in the County, from less than 150,000 incidents in 1970 to over 285,000 incidents in 1975. Because of increased demand and increasingly sophisticated delivery techniques, the costs of providing emergency medical services have also increased. Furthermore, the number of organizations involved in providing emergency services is growing.

There are more than one hundred organizations in the County that have a role in providing services to victims of medical emergencies. These organizations have different degrees of involvement, ranging from peripheral relationships to direct responsibility. The organizational relationships of the majority of them have been depicted graphically and briefly described in three exhibits: Exhibit 2-B on pages 2.11 through 2.14 depicts the role of the County of Los Angeles; Exhibit 2-C on pages 2.15 through 2.17 depicts the role of the independent cities in the County, and the role of the State of California; and Exhibit 2-D on pages 2.18 and 2.19 describes other organizations, both governmental and professional, with an emergency medical services role.

There is no single agency in Los Angeles County with the authority to manage and control the delivery of emergency medical services. The Emergency Medical Care Committee can act only in an advisory capacity to the Board of Supervisors and the County Department of Health Services. The Director of the County Department of Health Services has the responsibility for establishing training and certification standards for paramedics, but has little control over the 1,300 EMT I's operating in the County. The Emergency Medical Systems Division of the Department of Health Services has personnel involved in many aspects of emergency services, but has little direct control over the operations of emergency

providers. Each of the sixty-seven providers of field emergency medical services in the County has organizational responsibility for its own method of delivering services and for its own operating policies and procedures.

Because of increased demand, increased costs, and the lack of central management and control, the Los Angeles County Board of Supervisors commissioned a survey to evaluate field emergency medical services. The objectives of the survey were to evaluate services currently paid for by the County and to study alternative approaches for providing adequate emergency services throughout the County.

SCOPE OF THE SURVEY

The scope of the survey was limited to the major components of field emergency medical services in the County of Los Angeles: the reporting of an incident, the response to the scene, treatment at the scene, and patient transportation. Treatment in hospital emergency rooms and subsequent follow-up care were excluded. The scope of the survey was summarized by the County as follows:

- Identification and quantification of field emergency medical services provided by the County and by public agencies and private companies within the County
- Evaluation of the efficiency and effectiveness of the emergency medical services currently being provided
- Development of recommendations, supported by cost data, to assist the Board of Supervisors in determining the most effective countywide organization to meet the County's field emergency medical service needs
- Definition of the role, responsibilities, and structure of County management in the operation of the recommended countywide organization

END PRODUCTS REQUIRED

The major end products requested by the County were:

- A description and evaluation of existing services

- A detailed operational and financial review of selected private ambulance companies to determine present and past profitability and to provide a statistical base for further analysis
- An analysis of alternative methods of providing field emergency medical services in the County
- An analysis of the advantages and disadvantages of the alternatives
- A determination of the most effective organization for providing field emergency medical services in the County

APPROACH

Production of the end products required a substantial amount of data collection and technical analysis. The data collection and technical analysis activities of the survey were organized into four major areas:

- Data Collection - on-site reviews with each of the forty public providers and the major private providers operating in the County to obtain the information required for analyzing the existing emergency medical services
- Costs - determination of the current expenditures on both a direct and indirect basis for each emergency delivery system and for the County as a whole
- Resource Allocation - projection of the number of response units that would be required under alternative configurations based upon present demand and upon estimates of demand in 1980
- Private Ambulance Company Review - analysis and documentation of the financial records of selected private ambulance companies to estimate profitability under the current contract rates

Data Collection

Prior to beginning field work, existing reports and studies were reviewed to determine the data currently available and the data that needed to be collected. It was determined

that all providers of field emergency medical service would be reviewed to obtain a firsthand knowledge of each provider's operation and its interactions with other providers. A detailed questionnaire was prepared for use by project team members during the on-site reviews to ensure uniform data collection. Exhibit 2-E on page 2.20 is a listing of providers reviewed during the data collection activities.

At the completion of the review and analysis of each public and private provider, a summary of pertinent information was prepared and returned to the provider for review and comment. Each provider's comments were reviewed before the data describing its operations was included in this report.

Costs

An understanding of the costs and cost relationships involved in emergency ambulance operations was essential to an evaluation of alternatives. The cost analysis area, therefore, was emphasized throughout the survey. The number of providers and the variations in the types of delivery systems being utilized in the County made simple approaches to the development of cost data inadequate. A comprehensive cost methodology was developed to analyze cost data required for the evaluation of complex operations and complex alternatives. Estimates of the 1975 costs of emergency medical services in Los Angeles County were developed utilizing the cost methodology. This data was projected to provide an estimate of 1980 costs using 1975 prices and 1980 demand and resource requirements data for evaluating alternative system configurations and management options.

Resource Allocation

The techniques used to estimate the demand for emergency medical services and to determine resource requirements were based upon available research materials and upon other studies which projected County emergency medical services resource requirements. An important objective of the activities in this area was to avoid duplicating existing data, if such data were determined to be reliable and would satisfy the requirements of this survey. Among the material that was utilized was work done by the Los Angeles Countywide Coordinating Council on Emergency Medical Services. In its June 1975 report, the Council examined potential 1980 demand and resource requirements and developed a set of detailed

recommendations regarding County emergency medical services. Their material was extensively reviewed to understand what they had done and to determine the extent to which data they developed could be utilized in this survey.

Private Ambulance Company Review

There were twenty-two private ambulance companies, varying in size from small operators with only a few vehicles to large operators with more than thirty vehicles, that operated in the County of Los Angeles. It was decided that the nineteen companies belonging to the Los Angeles County Ambulance Association would be reviewed.

Although contractual provisions allow for annual financial and operational reviews for those companies contracting with the County, these contractual provisions had not previously been exercised. Consequently, financial and operational information for the reviews was obtained from discussions with company officers and from examinations of internal company documents and related County records.

DEFINITION OF TERMS

General

Throughout this report, the terms emergency ambulance services, emergency services, and emergency medical services ("EMS") will be used interchangeably. Each of the terms is used in the County to describe on-site treatment and transportation of an individual who is the victim of a medical emergency.

The term incident has been used to describe an assumed emergency situation to which an emergency services provider dispatches a response unit. The term response unit has been used to describe the unit, including vehicles and manpower, which is dispatched in response to a normal emergency incident. For example, in the City of Los Angeles' operation, a rescue ambulance with two men is dispatched on all runs. For calls requiring additional assistance, an engine company with five men is also dispatched. In the City, the response unit is the rescue ambulance. The engine company is either an assist unit when it makes the run with the rescue ambulance, or a backup unit, responding in lieu of the rescue ambulance when the ambulance is not available for service.

In the County Fire Department operation, the response unit is a two man squad truck (squad) and an engine company having three or four men. Because the engine always accompanies the squad as part of normal operations, both vehicles together have been considered the response unit.

Personnel Classifications

Four personnel classifications have been used to describe the training level and capabilities of the men assigned to response units:

- FA/CPR: persons who have completed an approved course in advanced first aid (FA) and cardio-pulmonary resuscitation (CPR)
- EMT I: (Emergency Medical Technician Level I) persons who have completed an approved training course which adheres to the present eighty-one hour U. S. Department of Transportation (DOT) Basic Training Course for Emergency Medical Technicians. The course content covers various aspects of treatment, including anatomy and physiology, vital signs, injuries, burns, acute poisoning, and training in vehicle operation and equipment use.
- EMT II: (Emergency Medical Technician Level II) persons who have completed a course similar to the 480 hour DOT Advanced Training Course. In addition to expanded coverage of the material in the eighty-one hour DOT basic course, the advanced course includes:
 - . Cardiac monitoring with recognition of life-threatening arrhythmias
 - . Defibrillation techniques
 - . Intravenous techniques
 - . Administration of drugs for advanced life support
- Paramedic: persons in the County of Los Angeles who have completed an advanced EMT training course which includes several features beyond those of the 480 hour DOT EMT II curriculum. The training program includes 1,000 hours of

classroom (didactic) activity and clinical practice similar to that required in the DOT course. The program includes field observation and training, as well as participation in actual incidents as a team member along with two experienced paramedic personnel.

The terms "paramedic" and "EMT II" have been used interchangeably throughout the report because the use of the term paramedic alone might lead to some confusion among those people not familiar with the Los Angeles County paramedic training program.

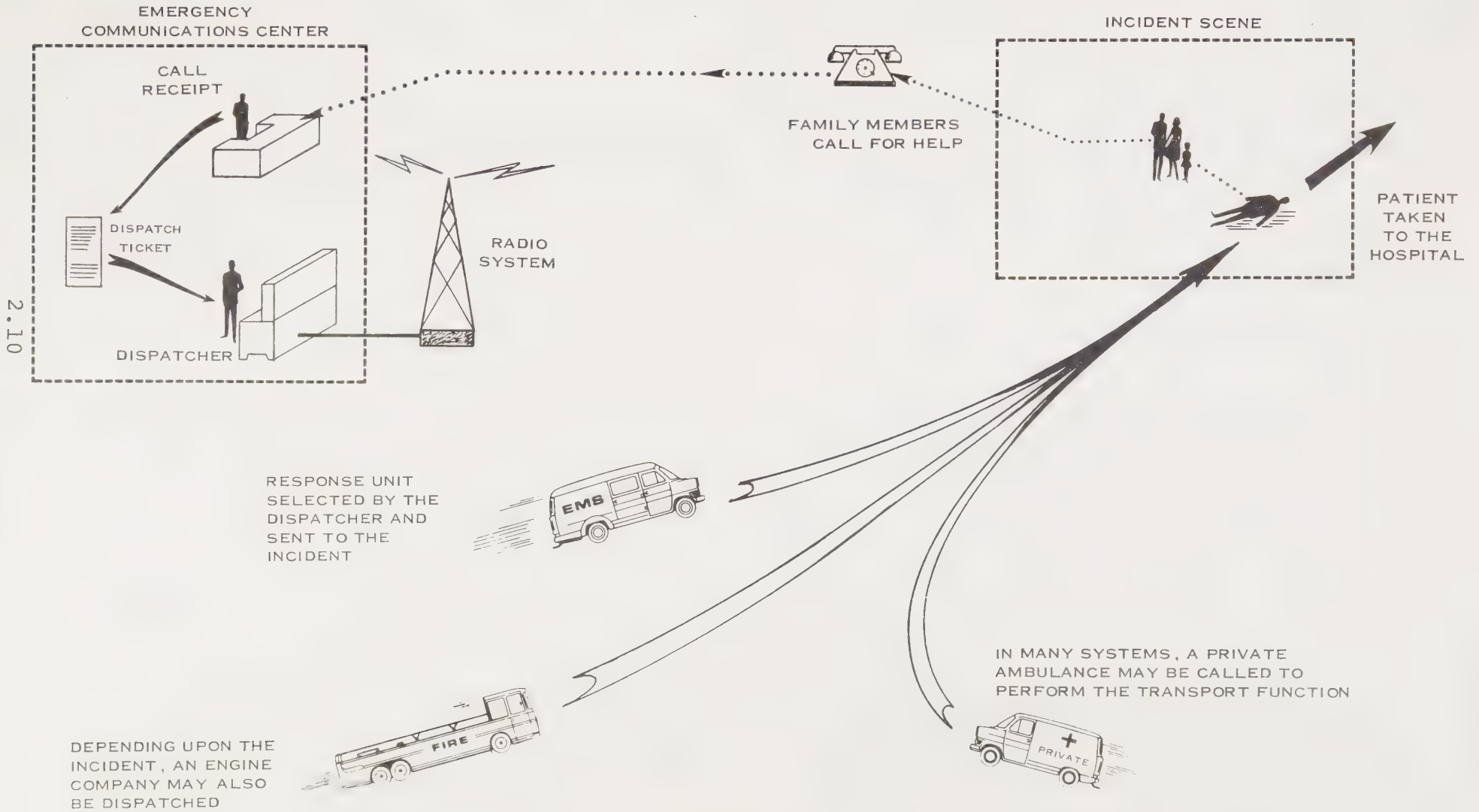
Sequence of Events

The definitions that are the most important to an understanding of the results of the survey are those involved in the sequence of events that comprise an emergency incident. Exhibit 2-F on page 2.21 graphically illustrates these events from the onset of symptoms to the final disposition of an incident.

- Notification Delay is the interval from the time when an accident occurs or when an individual begins to need emergency services (Point A) and the time when a call for service is received by the emergency services system (Point B).
- Dispatch Delay is the elapsed time interval between the receipt of the call for service (Point B) and the "time out" or the point at which the response unit has been selected and dispatched (Point C).
- Travel Time is the elapsed time interval between the "time out" (Point C) for the response unit and the "on-scene" time (Point D) reported by the responding unit personnel.
- Response Time is the elapsed time interval between the receipt of the first call for service (Point B) and the time reported as "on-scene" (Point D) by the responding unit.
- Service Time is the elapsed time interval between the "on-scene" time (Point D) and the "available-for-dispatch" time (Point G) reported by the responding unit.

- Commitment Time is the elapsed time interval during which the responding unit is unavailable for dispatch. It is the interval between Points C and G or from "time out" to "available-for-dispatch".
- Total Incident Time is the elapsed time interval between the receipt of the first call for service (Point B) and the subsequent report of "available-for-dispatch" by the responding unit (Point G).

EMERGENCY MEDICAL INCIDENT RESPONSE GENERAL DESCRIPTION



GOVERNMENTAL AND OTHER ENTITIES WITH A ROLE RELATING TO
LOS ANGELES COUNTY EMERGENCY MEDICAL SERVICES
FIELD OPERATIONS OR TRANSPORT

TOUCHE ROSS & CO.

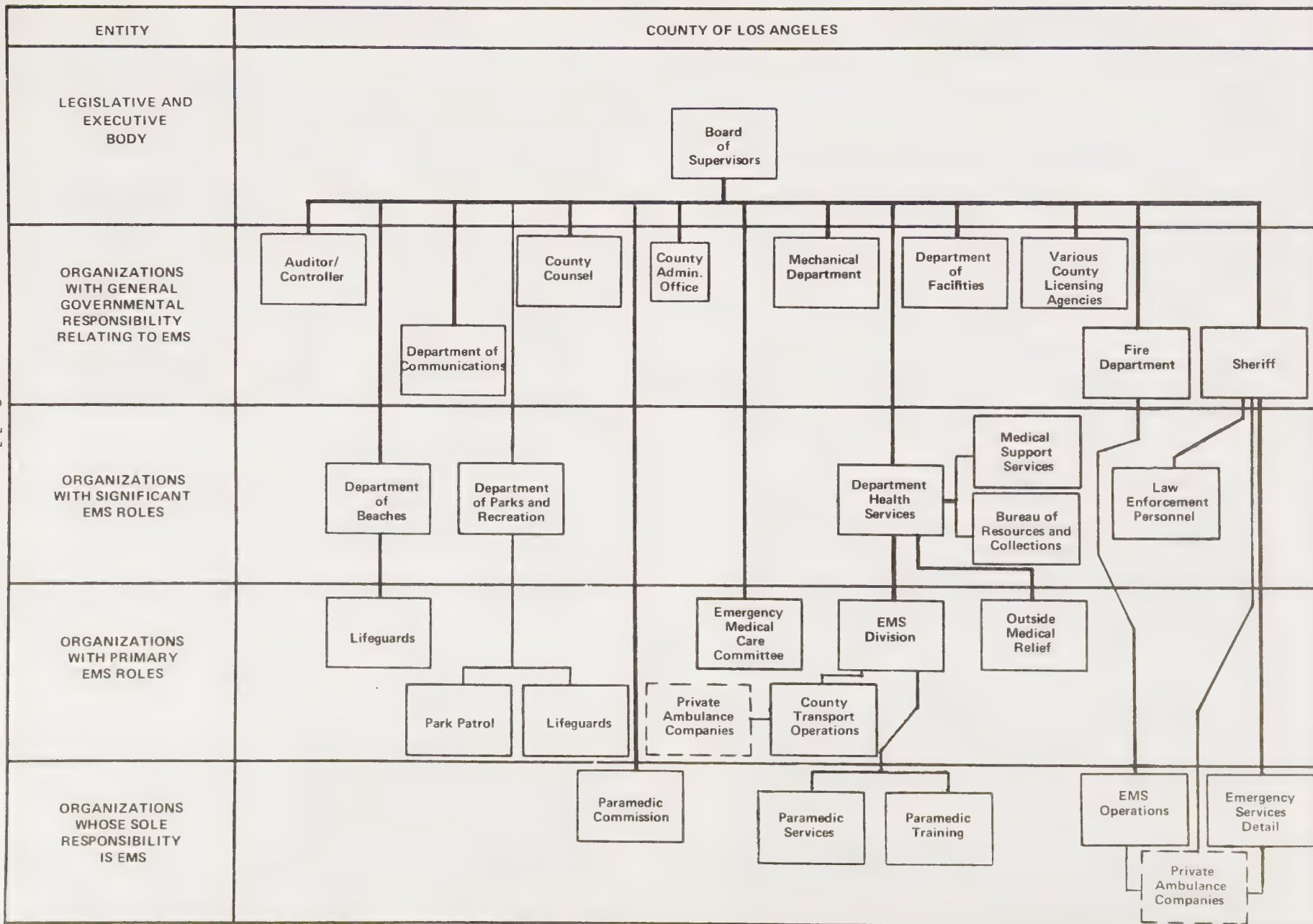


EXHIBIT 2-B

2.11

DESCRIPTION OF ORGANIZATIONAL ROLESCOUNTY OF LOS ANGELES

BOARD OF SUPERVISORS: PERFORMS THE COUNTY'S LEGISLATIVE AND EXECUTIVE FUNCTIONS; TAKES ACTIONS WHICH IMPACT THE DELIVERY OF EMERGENCY MEDICAL SERVICES COUNTYWIDE.

AUDITOR-CONTROLLER: MANAGES FINANCIAL AND BUDGETARY MATTERS AND ACTS AS OVERALL FINANCIAL CONTROLLER FOR FEDERAL GRANTS AND DEPARTMENTAL EXPENDITURES FOR THE COUNTY AND ITS AGENCIES.

DEPARTMENT OF BEACHES: PROVIDES LIFEGUARDS FOR ALL COUNTY BEACH AREAS. THE LIFEGUARDS PROVIDE FIRST RESPONSE CAPABILITY FOR WATER-RELATED INJURIES AS WELL AS GENERAL FIRST AID AND CPR FOR OTHER INCIDENTS OCCURRING ON THE COUNTY'S BEACHES. A MORE DETAILED DESCRIPTION OF THEIR ROLES IS PRESENTED IN APPENDIX H OF THIS REPORT.

DEPARTMENT OF COMMUNICATIONS: PROVIDES TECHNICAL ASSISTANCE, OPERATING SERVICES AND MAINTENANCE TO OTHER COUNTY DEPARTMENTS IN AREAS RELATING TO COMMUNICATIONS. SEVERAL TYPES OF COMMUNICATIONS CAPABILITIES ARE INCLUDED WITHIN THE SCOPE OF THE DEPARTMENT, INCLUDING TELEPHONE, VOICE, RADIO, MICROWAVE, AND TELEMETRY.

DEPARTMENT OF PARKS AND RECREATION: PROVIDES LIFEGUARD SERVICES FOR COUNTY LAKES AND POOLS AS WELL AS PARK PATROL SECURITY SERVICES TO THE COUNTY'S PARKS AND REGIONAL RECREATION AREAS. THE LIFEGUARDS PROVIDE A FIRST RESPONSE CAPABILITY FOR WATER-RELATED INJURIES AND, ALONG WITH THE PARK PATROL, PROVIDE GENERAL FIRST AID AND CARDIO-PULMONARY RESUSCITATION FOR OTHER INCIDENTS OCCURRING WITHIN THEIR SERVICE AREA. A MORE COMPLETE DESCRIPTION OF THEIR ROLE IS PRESENTED IN APPENDIX H OF THIS REPORT.

(CONTINUED)

COUNTY OF LOS ANGELES

COUNTY COUNSEL: PROVIDES LEGAL SERVICES, INCLUDING CONTRACT PREPARATION AND REVIEW, STATUTORY AND REGULATORY INTERPRETATION, LEGAL OPINIONS, AND LEGAL DEFENSE TO THE COUNTY AND ITS AGENCIES.

PARAMEDIC COMMISSION: PROVIDES A FORUM FOR PUBLIC REVIEW OF ISSUES INVOLVING PARAMEDIC SERVICES AND TRAINING. IT HEARS APPEALS ON POLICIES AND STANDARDS FOR PARAMEDIC AND MICU NURSE CERTIFICATIONS, AND APPEALS ON DEPARTMENT OF HEALTH SERVICES PARAMEDIC CERTIFICATION DECISIONS.

CHIEF ADMINISTRATIVE OFFICE ("CAO"): PROVIDES FINANCIAL, BUDGETING, GENERAL CONTRACT MANAGEMENT AND ADMINISTRATIVE SERVICES TO THE COUNTY AND ITS AGENCIES.

EMERGENCY MEDICAL CARE COMMITTEE ("EMCC"): SERVES IN AN ADVISORY CAPACITY TO THE BOARD OF SUPERVISORS AND THE DEPARTMENT OF HEALTH SERVICES. THE EMCC CONDUCTS SUCH SPECIAL STUDIES OF EMERGENCY MEDICAL CARE AS MAY BE REQUIRED. IT REPORTS PERIODICALLY TO THE BOARD OF SUPERVISORS AND ANNUALLY TO THE CALIFORNIA STATE DEPARTMENT OF HEALTH ON EMERGENCY SERVICES IN LOS ANGELES COUNTY.

MECHANICAL DEPARTMENT: REPAIRS AND MAINTAINS COUNTY VEHICLES AND INSPECTS PRIVATE AMBULANCE COMPANY VEHICLES WHERE THE AMBULANCE COMPANY IS UNDER CONTRACT TO THE COUNTY FOR MEDICAL TRANSPORT SERVICES.

DEPARTMENT OF HEALTH SERVICES: ADMINISTERS ALL COUNTY HEALTH SERVICES, INCLUDING HOSPITALS, CLINICS AND OTHER FACILITIES, NURSING PROGRAMS, ALCOHOL AND DRUG ABUSE PROGRAMS, AS WELL AS PROGRAMS RELATING TO EMERGENCY MEDICAL SERVICES.

(CONTINUED)

DESCRIPTION OF ORGANIZATIONAL ROLESCOUNTY OF LOS ANGELES

EMERGENCY MEDICAL SYSTEMS DIVISION: ADMINISTERS AND ASSISTS IN THE REGULATION OF EMERGENCY MEDICAL SERVICES IN THE COUNTY, INCLUDING PARAMEDIC STANDARDS AND TRAINING, PUBLIC EDUCATION, THE EMERGENCY AID PROGRAM, DISASTER SERVICES, AND OTHER EMS-RELATED PROGRAMS.

COUNTY TRANSPORT OPERATIONS: INCLUDES SEVERAL DIFFERENT PARTS OF THE DEPARTMENT OF HEALTH SERVICES INVOLVED IN TRANSPORT OPERATIONS USING COUNTY VEHICLES AND PRIVATE AMBULANCE COMPANIES. THESE OPERATIONS INCLUDE EAP PRE-HOSPITAL TRANSPORT, TRANSPORTS TO AND BETWEEN THE COUNTY'S HOSPITALS, AND DISASTER SERVICES TRANSPORTS.

PARAMEDIC SERVICES: REVIEWS PARAMEDIC PERFORMANCE COUNTYWIDE. PROVIDES ONGOING EDUCATION, CERTIFICATION, RECERTIFICATION, AND STANDARDS REVIEWS OF PARAMEDICS THROUGHOUT LOS ANGELES COUNTY. ASSISTS THE PARAMEDIC TRAINING UNIT IN TRAINING. PROCESSES MICU FORMS AND PREPARES STATISTICAL INFORMATION. PARAMEDIC SERVICES ALSO PARTICIPATES IN THE SELECTION AND PURCHASING OF PARAMEDIC EQUIPMENT FOR THE COUNTY FIRE DEPARTMENT AND IS INVOLVED IN A WIDE RANGE OF GENERAL PURPOSE PARAMEDIC SERVICES AND PUBLIC RELATIONS ACTIVITIES IN LOS ANGELES COUNTY.

ADMINISTRATIVE OPERATIONS: OFFICES WITHIN THE DEPARTMENT OF HEALTH SERVICES PROVIDE ADMINISTRATIVE SUPPORT FOR EMERGENCY MEDICAL SERVICES FROM MEDICAL SUPPORT SERVICES; DISBURSEMENT AND BILLING SERVICES FOR EAP PRE-HOSPITAL TRANSPORT, CUSTODY TRANSPORT, AND HOSPITAL CHARGES FROM OUTSIDE MEDICAL RELIEF ("OMR"); AND COLLECTION SERVICES FOR THE BILLS SENT BY OMR FROM THE BUREAU OF RESOURCES AND COLLECTIONS ("BRC").

(CONTINUED)

COUNTY OF LOS ANGELES

DEPARTMENT OF FACILITIES: PROVIDES SPECIAL EXPERTISE AND ASSISTANCE TO VARIOUS COUNTY AGENCIES AND DEPARTMENTS IN THE AREA OF REAL ESTATE PURCHASES AND MANAGEMENT. THIS DEPARTMENT MAY ASSIST THE COUNTY FIRE DEPARTMENT IN THE DEVELOPMENT OF NEW FIRE STATIONS.

VARIOUS COUNTY LICENSING AGENCIES: PARTICIPATE IN THE REVIEW AND ENFORCEMENT OF COUNTY LICENSING ORDINANCES PERTAINING TO PRIVATE AMBULANCE COMPANIES.

FIRE DEPARTMENT - FORESTER AND FIRE WARDEN: PROVIDES FIRE PREVENTION, FIRE PROTECTION, RESCUE, AND PARAMEDIC SERVICES TO ALL UNINCORPORATED AREAS OF LOS ANGELES COUNTY, AS WELL AS TO THE THIRTY-NINE CITIES WHICH ARE PART OF THE COUNTY'S CONSOLIDATED FIRE PROTECTION DISTRICTS.

PARAMEDIC COORDINATION: PROVIDES GENERAL SUPERVISION, PLANNING, RESOURCE ALLOCATION, MANPOWER COORDINATION, AND COORDINATION OF TRAINING, CERTIFICATION, AND RECERTIFICATION SERVICES FOR THE FIRE DEPARTMENT EMS OPERATIONS.

SHERIFF: PROVIDES LAW ENFORCEMENT SERVICES TO ALL UNINCORPORATED AREAS OF THE COUNTY, AS WELL AS TO CITIES IN THE COUNTY WHICH HAVE CONTRACTED FOR THE SHERIFF'S SERVICES. THE SHERIFF'S LAW ENFORCEMENT PERSONNEL MAY RENDER FIRST AID OR CPR WHEN THEY ARE THE FIRST TO ARRIVE AT THE SCENE OF A MEDICAL EMERGENCY. THE SHERIFF ALSO PARTICIPATES IN THE DISPATCHING OF PRIVATE AMBULANCES FOR TRANSPORTS WITHIN HIS SERVICE AREA. IN ADDITION, THE SHERIFF ISSUES OR AUTHORIZES OTHER AGENCIES TO ISSUE EAP TICKETS, AND SUBMITS LOGS OF THE EAP TICKETS ISSUED TO THE DEPARTMENT OF HEALTH SERVICES' EMS DIVISION.

(CONTINUED)

DESCRIPTION OF ORGANIZATIONAL ROLESCOUNTY OF LOS ANGELES

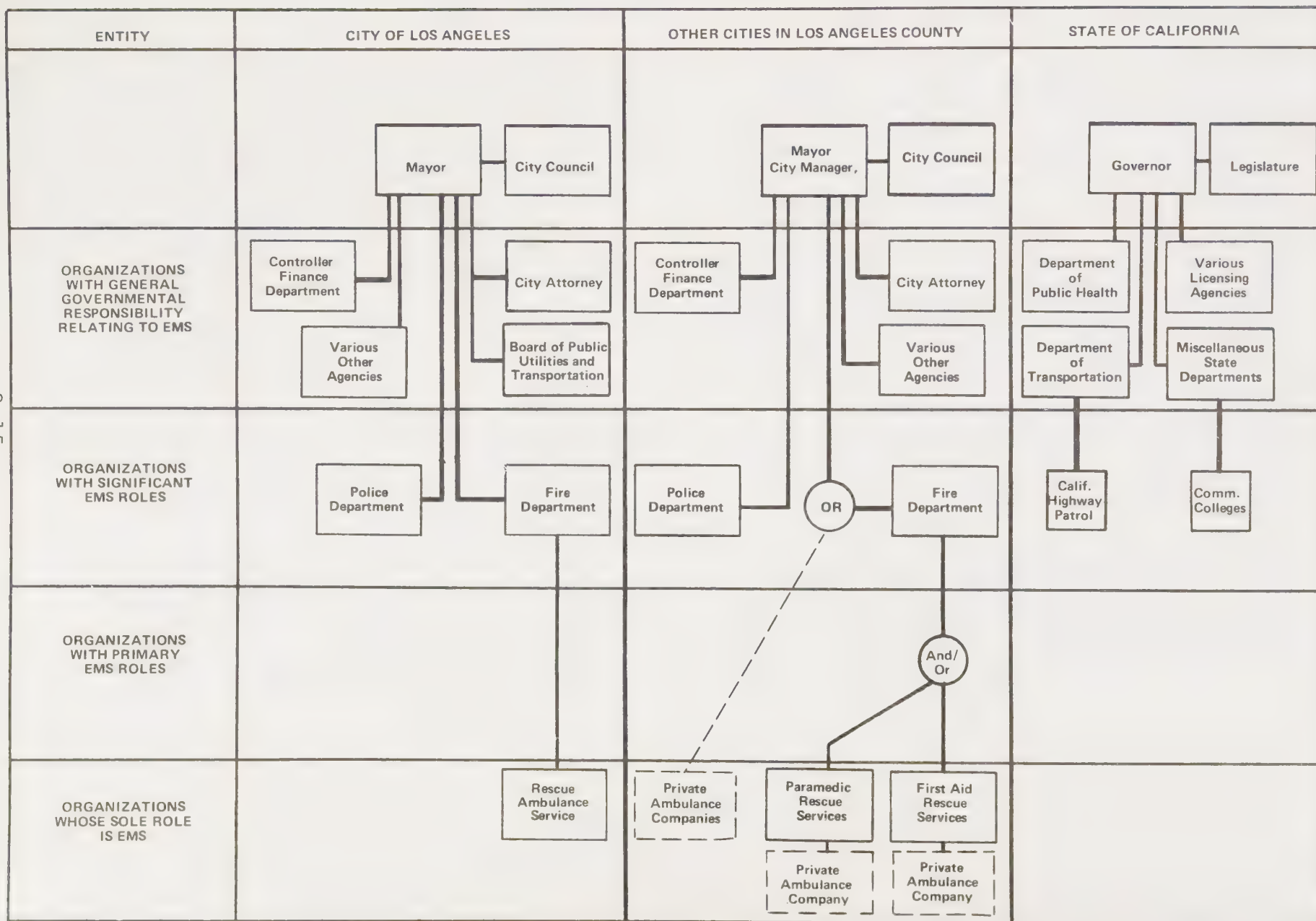
EMERGENCY SERVICES DETAIL: PROVIDES SEARCH AND RESCUE SERVICES WITHIN THE SHERIFF'S SERVICE AREA. THE SHERIFF USES HELICOPTERS AND SPECIALLY TRAINED PARAMEDIC PERSONNEL FOR MOUNTAIN AND MARINE SEARCHES AND RESCUES, AND OFTEN ASSISTS OTHER AGENCIES IN TRANSPORTING INJURED PATIENTS FROM REMOTE OR INACCESSIBLE LOCATIONS. A COMPLETE DESCRIPTION OF THE EMERGENCY SERVICES DETAIL IS PROVIDED IN APPENDIX H OF THIS REPORT.

(CONTINUED)

COUNTY OF LOS ANGELES

PRIVATE AMBULANCE COMPANIES: PROVIDE EMERGENCY TRANSPORTATION WHEN REQUESTED BY A PUBLIC AGENCY AND IN SOME AREAS HAVE THE PRIMARY RESPONSE UNITS FOR EMERGENCY MEDICAL SERVICES. THEY ALSO PROVIDE BOTH EMERGENCY AND NONEMERGENCY TRANSPORTS AT THE REQUEST OF PRIVATE CITIZENS, CONTRACT TO TRANSPORT PATIENTS IN THE CUSTODY OF LAW ENFORCEMENT OFFICERS TO AND BETWEEN HOSPITAL FACILITIES, AND CONTRACT TO PROVIDE INDIGENT PATIENTS WITH NONEMERGENCY TRANSPORTATION TO AND BETWEEN HOSPITALS, OTHER HEALTH CARE FACILITIES AND PRIVATE HOMES.

GOVERNMENTAL AND OTHER ENTITIES WITH A ROLE RELATING TO
LOS ANGELES COUNTY EMERGENCY MEDICAL SERVICES
FIELD OPERATIONS OR TRANSPORT



DESCRIPTION OF ORGANIZATIONAL ROLES

CITY OF LOS ANGELES

THE ENTITIES DESCRIBED IN THIS EXHIBIT AS HAVING AN EMS ROLE IN THE CITY OF LOS ANGELES FULFILL FUNCTIONS SIMILAR TO THEIR COUNTERPARTS IN LOS ANGELES COUNTY. THE CITY ATTORNEY, FOR EXAMPLE, PERFORMS FUNCTIONS SIMILAR TO THOSE OF THE COUNTY COUNSEL. THE CITY OF LOS ANGELES FIRE DEPARTMENT AND ITS RESCUE AMBULANCE SERVICE ARE OPERATIONALLY DIFFERENT FROM THEIR COUNTY COUNTERPARTS, BUT PERFORM THE SAME GENERAL ORGANIZATIONAL ROLE.

THERE ARE, HOWEVER, CITY OF LOS ANGELES AGENCIES WHICH FULFILL DIFFERENT ORGANIZATIONAL ROLES.

BOARD OF PUBLIC UTILITIES AND TRANSPORTATION: RECOMMENDS AMBULANCE COMPANY RATES TO BE CHARGED WITHIN THE CITY OF LOS ANGELES. THE BOARD IS ALSO INVOLVED IN OTHER POLICY AND REGULATORY FUNCTIONS WITH REGARD TO PRIVATE AMBULANCE COMPANIES.

POLICE DEPARTMENT ("LAPD"): FREQUENTLY RECEIVES THE FIRST CALL FOR A MEDICAL EMERGENCY OR IS FIRST ON THE SCENE. THE POLICE DEPARTMENT MAY ADMINISTER FIRST AID OR CPR ON THE SCENE AND WILL CALL FOR ADDITIONAL EMS SUPPORT WHEN NECESSARY. THE LAPD, UNLIKE THE SHERIFF, DOES NOT DISPATCH AMBULANCES OR SUBMIT EAP LOGS TO THE COUNTY.

OTHER CITIES IN LOS ANGELES COUNTY

THE ROLES OF THE DEPARTMENTS AND AGENCIES IN THE CITIES IN THE COUNTY PARALLEL THE ROLES OF BOTH LOS ANGELES COUNTY AND THE CITY OF LOS ANGELES. OPERATIONAL CONFIGURATIONS MAY VARY SIGNIFICANTLY FROM CITY TO CITY, BUT THE ORGANIZATIONAL ROLES REMAIN SIMILAR.

ALL FIRE DEPARTMENTS IN THE COUNTY DO NOT PROVIDE PARAMEDIC SERVICES. SEVERAL CITIES UTILIZE PRIVATE AMBULANCE COMPANIES AS PRIMARY PROVIDERS. OTHERS PROVIDE THEIR OWN FIRST AID RESCUE SERVICES AND DO NOT HAVE A PARAMEDIC FORCE. IF THE FIRE DEPARTMENT OF A CITY PROVIDES EMERGENCY MEDICAL SERVICES BUT DOES NOT HAVE PATIENT TRANSPORT CAPABILITY, OR WANTS TO LIMIT THE NUMBER OF TRANSPORTS IT MAKES, IT MAY CALL A PRIVATE AMBULANCE COMPANY FOR PATIENT TRANSPORTATION. A CITY MAY HAVE ITS OWN CONTRACT WITH AN AMBULANCE COMPANY OR AVAIL ITSELF OF CONTRACTS ENTERED INTO BETWEEN THE COUNTY AND THE PRIVATE AMBULANCE COMPANIES.

POLICE DEPARTMENTS AND FIRE DEPARTMENTS MAY FULFILL THE SAME ROLE WITH REGARD TO EAP TICKETS AND THE SUBMISSION OF EAP LOGS AS DOES THE SHERIFF IN LOS ANGELES COUNTY. WHERE THE FIRE DEPARTMENT FULFILLS SUCH A ROLE, THE POLICE ROLE WILL BE SIMILAR TO THAT OF THE LAPD.

DESCRIPTION OF ORGANIZATIONAL ROLES

STATE OF CALIFORNIA

THE ORGANIZATIONAL ROLES OF THE GOVERNOR, AND LEGISLATURE, THE VARIOUS LICENSING AGENCIES, AND THE MISCELLANEOUS STATE DEPARTMENTS ARE SIMILAR TO THEIR LOCAL GOVERNMENTAL COUNTERPARTS, BUT THE SCOPE OF THEIR ROLES IS NECESSARILY BROADER.

SEVERAL STATE ENTITIES FULFILL UNIQUE ROLES:

DEPARTMENT OF PUBLIC HEALTH: PROVIDES PLANNING AND POLICY GUIDELINES, REVIEWS PROGRAMS, AND ACTS IN AN ADVISORY CAPACITY TO COUNTY HEALTH AGENCIES OR OFFICERS TO WHOM LOCAL AUTHORITY IS DELEGATED. THE DEPARTMENT ALSO COLLECTS EMS STATISTICAL AND OPERATIONAL DATA FROM COUNTY HEALTH AGENCIES.

DEPARTMENT OF TRANSPORTATION: DETERMINES REGULATIONS AND REQUIREMENTS FOR VEHICLES AND EQUIPMENT USED BY PRIVATE AMBULANCE COMPANIES.

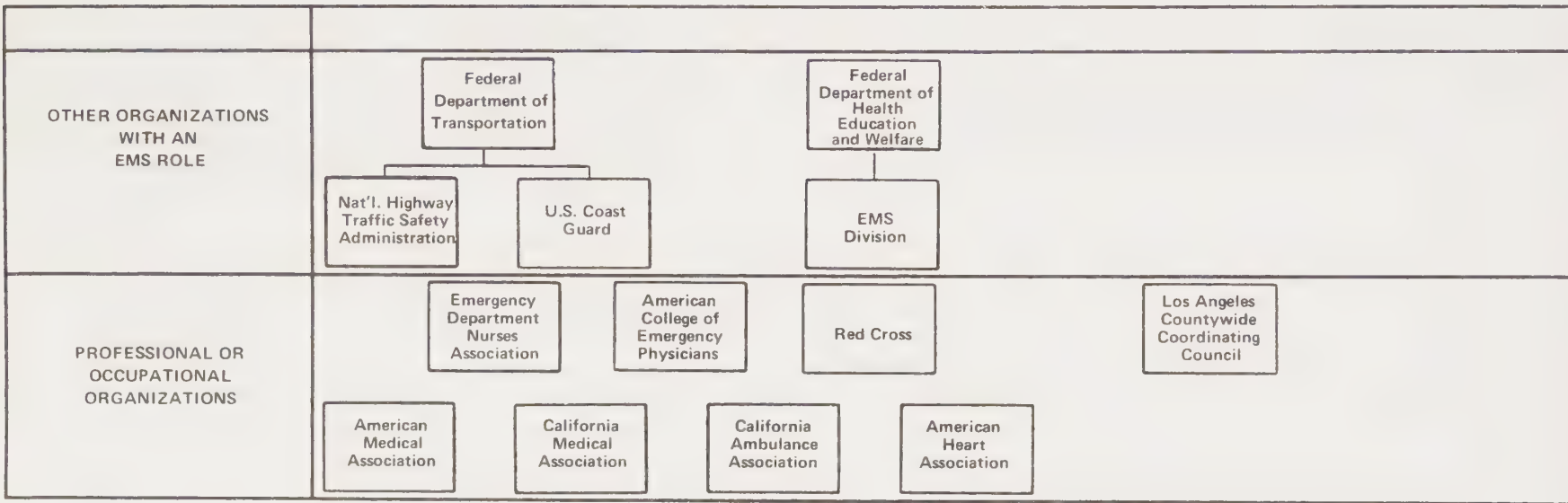
(CONTINUED)

STATE OF CALIFORNIA

CALIFORNIA HIGHWAY PATROL ("CHP"): ENFORCES STATE DEPARTMENT OF TRANSPORTATION GUIDELINES FOR PRIVATE AMBULANCE COMPANIES. THE CHP ALSO PROVIDES FIRST AID AND CPR FOR TRAFFIC ACCIDENTS OCCURRING IN UNINCORPORATED AREAS OF THE COUNTY AND ON ALL FREEWAYS, AND FOR CRIME VICTIMS AND PERPETRATORS WHEN THE CHP IS FIRST ON THE SCENE. CHP HELICOPTERS MAY PROVIDE BACKUP TRANSPORTATION SUPPORT FOR AGENCIES IN THE COUNTY REQUIRING HELICOPTER TRANSPORTS AND MAY BE USED TO TRANSPORT BOTH EMERGENCY MEDICAL SUPPLIES AND DONATED ORGANS FOR TRANSPLANT. A MORE COMPLETE DESCRIPTION OF THE CHP ROLE IS PROVIDED IN APPENDIX H OF THIS REPORT.

COMMUNITY COLLEGES: MAY CONDUCT EMT I AND EMT II TRAINING PROGRAMS

GOVERNMENTAL AND OTHER ENTITIES WITH A ROLE RELATING TO
LOS ANGELES COUNTY EMERGENCY MEDICAL SERVICES
FIELD OPERATIONS OR TRANSPORT



DESCRIPTION OF ORGANIZATIONAL ROLES

OTHER ORGANIZATIONS WITH AN EMS ROLE

FEDERAL DEPARTMENT OF TRANSPORTATION ("DOT") : PROVIDES COORDINATION FOR THE ESTABLISHMENT OF EMS TRAINING AND OPERATIONS GUIDELINES AND STANDARDS THROUGH GRANTS AWARDED BY THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION. THE DOT ALSO GATHERS AND DISSEMINATES A VARIETY OF EMS INFORMATION FROM AND TO STATE AND LOCAL GOVERNMENTS.

UNITED STATES COAST GUARD ("USCG") : THE COAST GUARD RENDERS MEDICAL ASSISTANCE FOR EMERGENCY INCIDENTS OCCURRING AT SEA OR ON THE WATERWAYS WITHIN ITS JURISDICTION. THE COAST GUARD ALSO PROVIDES SEARCH AND RESCUE SERVICES IN LOS ANGELES COUNTY WATERS AND PROVIDES HELICOPTER SUPPORT, IN COOPERATION WITH OTHER AGENCIES, FOR CLIFF RESCUES AND DIVING ACCIDENTS. USCG HELICOPTERS ARE ALSO USED AS A BACKUP TRANSPORT RESOURCE WHEN NEEDED. A COMPLETE DESCRIPTION OF THE COAST GUARD'S ROLE IS PRESENTED IN APPENDIX H OF THIS REPORT.

FEDERAL DEPARTMENT OF HEALTH, EDUCATION AND WELFARE ("DHEW") : ASSISTS THROUGH ITS EMS DIVISION IN THE FORMULATION OF EMS PLANNING GUIDELINES. DHEW ALSO AWARDS GRANTS, WHICH VARIOUS LOS ANGELES COUNTY AGENCIES HAVE RECEIVED, FOR TRAINING, RESEARCH, AND EQUIPMENT PURCHASES.

PROFESSIONAL OR OCCUPATIONAL ORGANIZATIONS

NUMEROUS PROFESSIONAL AND OCCUPATIONAL ORGANIZATIONS IN THE STATE AND COUNTY PARTICIPATE IN THE FORMULATION OF EMS POLICIES AFFECTING THEIR CONSTITUENTS AND OFTEN SERVE IN AN ADVISORY CAPACITY TO OTHER EMS POLICY-MAKING ENTITIES

EMS PROVIDERS REVIEWEDPUBLIC PROVIDERS

ALHAMBRA
ARCADIA
AVALON
AZUSA
BEVERLY HILLS
BURBANK
COMPTON
COVINA
CULVER CITY
DOWNEY
EL MONTE
EL SEGUNDO
GARDENA
GLENDALE
HAWTHORNE
HERMOSA BEACH
INGLEWOOD
LA VERNE
LONG BEACH
LOS ANGELES CITY

LOS ANGELES COUNTY
LYNWOOD
MANHATTAN BEACH
MONROVIA
MONTEBELLO
MONTEREY PARK
PALOS VERDES ESTATES
PASADENA
POMONA
REDONDO BEACH
SAN FERNANDO
SAN GABRIEL
SAN MARINO
SANTA FE SPRINGS
SANTA MONICA
SIERRA MADRE
SOUTH PASADENA
TORRANCE
VERNON
WEST COVINA

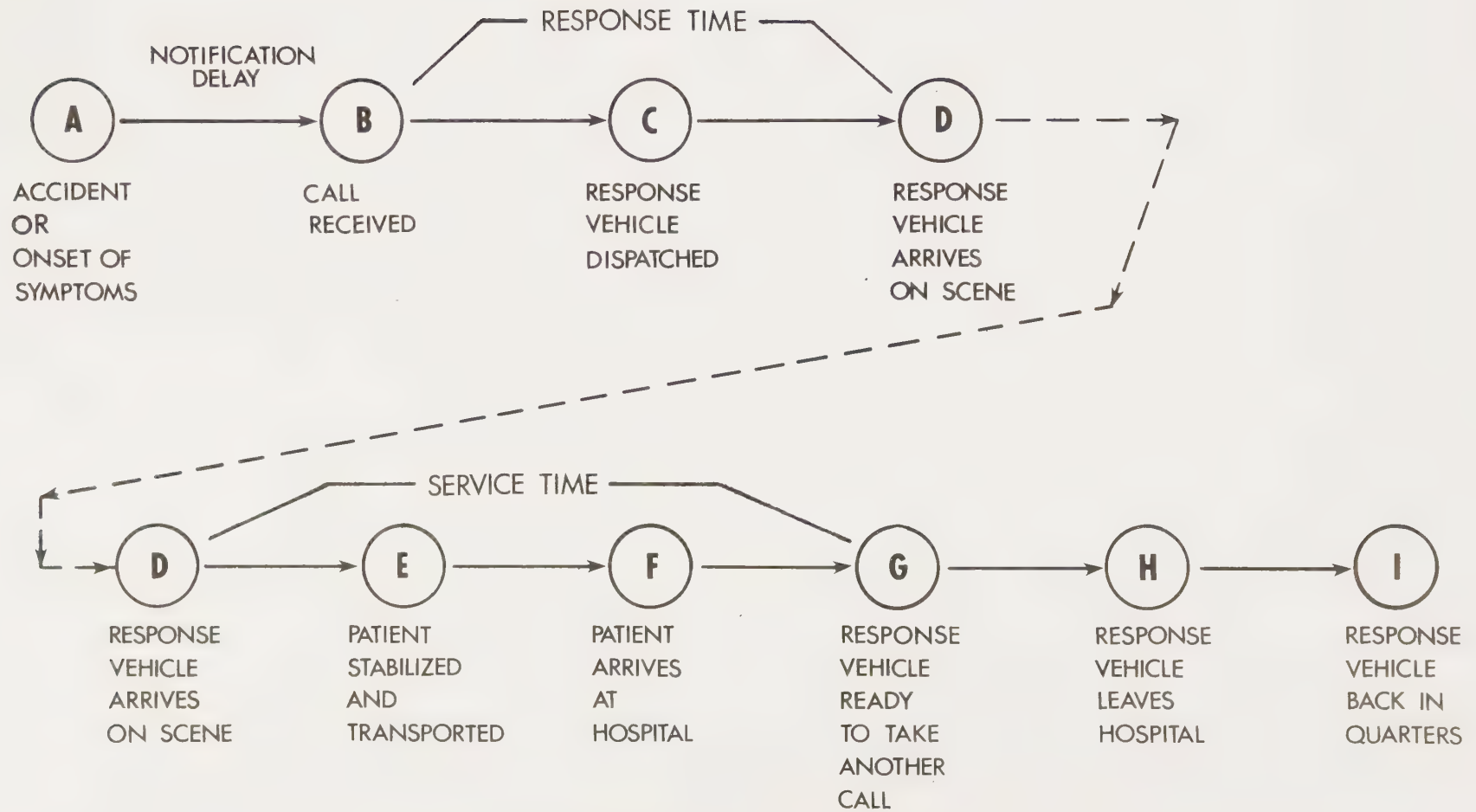
PRIVATE
AMBULANCE COMPANIES

ADAMS
AIDS
ANTELOPE VALLEY
ARCADIA-MONROVIA
ASSOCIATE
BOWERS
CARSON
COMMUNITY
CRIPPEN
DOLPHIN
GOODHEW
McCORMICK
NEWHALL
PROFESSIONAL
PRUNER
RISHER
SCHAEFER
SNYDER
WILSON

OTHER
PUBLIC PROVIDERS

CALIFORNIA HIGHWAY PATROL
LOS ANGELES COUNTY
DEPARTMENT OF BEACHES
LOS ANGELES COUNTY
DEPARTMENT OF PARKS
AND RECREATION
LOS ANGELES COUNTY
SHERIFF
UNITED STATES COAST
GUARD

TIME SEQUENCE OF EVENTS



SECTION 3

CURRENT PROVIDER OPERATIONS

COUNTY CHARACTERISTICS

As shown in Exhibit 3-A on page 3.9 and Exhibit 3-B on page 3.10, the County has an area of over 4,000 square miles and a wide variety of terrain, including mountains, desert, flatlands, beaches, forests, and farmland. The population is in excess of 7,000,000 and is concentrated in the southern portion of the County below the major mountain ranges. The populated areas are primarily medium density housing, but large parts of the County are high density urban areas. The majority of the County consists of low density mountain and desert regions, but many of these areas receive significant weekend and seasonal recreational usage and attendant population increases. Exhibit 3-C on page 3.11 is a map which depicts resident population density by area in Los Angeles County.

Geography and population factors vary across the County; therefore, operating characteristics of emergency medical services also change. A system in a low density mountainous region has different operating requirements than a system in a high density urban area.

There are over 2,900 square miles of unincorporated area in Los Angeles County. Exhibit 3-D on page 3.12 shows that while most of the unincorporated area is in the northern and western portions of the County, a significant portion of the more populous southern area is also unincorporated. Over 1,000,000 people live in these unincorporated areas of the County.

Over 6,000,000 people live in the more than 1,100 square miles of incorporated cities in the County. There are seventy-eight cities that range in area from less than one square mile to over 460 square miles and in population from 245 to over 2,700,000.

EMS PROVIDERS

There are sixty-seven providers of emergency medical services in the County of Los Angeles. Twenty-two of the sixty-seven are private ambulance companies which range in size from large urban providers with over thirty units to small rural providers with less than five units. The private companies

operate out of sixty-seven locations in the County. The remaining forty-five are public providers of emergency medical services, including the County Fire Department, thirty-nine independent cities, the Sheriff, the County Department of Beaches, the County Department of Parks and Recreation, the California Highway Patrol and the United States Coast Guard. For the purposes of this survey, forty of the public providers have been considered primary jurisdictional providers (or primary providers) of emergency ambulance service.

Primary Jurisdictional Providers

The Los Angeles County Fire Department is the primary jurisdictional provider of emergency medical services for the unincorporated area of the County and for thirty-nine cities which receive fire protection services from the County. The County Fire Department is responsible for an area of about 3,250 square miles and a population of over 2,100,000 people. The remaining thirty-nine cities in the County not serviced by the County Fire Department each have their own emergency medical services delivery system and are themselves primary jurisdictional providers. These cities provide services to over 5,000,000 people and cover an area of over 750 square miles.

All forty of the primary providers use fire department resources in their emergency operations. Fire department involvement ranges from the use of dispatch operations only to the utilization of fire department personnel for on-scene definitive care and patient transportation. Twenty-six of the providers involve private ambulance companies in their operations. Private ambulance involvement ranges from limited use as a backup transportation resource to providing all of a jurisdiction's on-scene definitive care and patient transportation. Exhibit 3-E on pages 3.13 through 3.17 lists each of the primary jurisdictional providers and shows the type of service provided by jurisdiction. Exhibit 3-E also lists, for each provider, the number and training levels of personnel, the number of response stations and the average area and population serviced by each response station.

Twenty of the providers dispatch fire equipment on all runs, either as the primary response unit or as an assist unit. Twenty-seven of the providers utilize primary response units which have transport capability. Twenty-seven of the primary providers utilize private ambulance companies for some or all of their patient transports. Exhibit 3-F on pages 3.18 through 3.22 lists the types and quantities of response and backup vehicles utilized by each primary provider. The exhibit also describes key operating characteristics, including

the 1975 incident volume and the percentage of incidents which resulted in patient transports for each provider.

Response Unit Locations

There are currently 190 response unit locations in the County. Of this total, 128 are primary response locations maintained by primary jurisdictional providers. Table A shows the distribution of these locations between fire departments and private ambulance companies. Exhibit 3-G on page 3.23 displays the location of response units in the southern portion of the County. Shown are the locations of:

- City of Los Angeles rescue ambulance units
- County Fire Department squad units
- County Fire Department engine companies which serve as primary response units (3)
- Other fire department primary response units
- Private ambulance company vehicle stations

Exhibit 3-H on page 3.24 shows the four County Fire Department and the three private ambulance response unit locations in the northern portion of the County. The 128 response locations shown on the two exhibits are stations for one or more of the 132 primary response units in the County.

TABLE A

SUMMARY OF RESPONSE UNIT LOCATIONS

	<u>Primary</u>	<u>Backup</u>	<u>Total</u>
Los Angeles City Fire	39	2	41
Los Angeles County Fire	34	-	34
Other Fire Departments	48	-	48
Private Ambulance Companies	<u>7</u>	<u>60</u>	<u>67</u>
TOTAL	128	62	190

Types of Delivery Systems

The major operating differences between the primary EMS providers in Los Angeles County are contained in various combinations of four major components: (1) use of fire department personnel or a private ambulance company for field services; (2) use of full-time EMS or dual-role fire department personnel; (3) dispatch of engine companies to all or only part of the EMS incidents; and (4) the use of a fire department vehicle or a private ambulance for the transport of patients. The providers in Los Angeles County have been categorized using these four characteristics. Factors such as the level of personnel on the vehicle have not been used in categorizing the providers. Although factors such as these are important in assessing the quality of care provided by a jurisdiction, they are not key factors in distinguishing the operating differences among providers.

Using the four major components described above, the forty primary providers in the County have been categorized into fifteen different delivery system types. Exhibit 3-I on pages 3.25 and 3.26 describes the fifteen delivery systems that currently exist in the County. Exhibit 3-J on pages 3.27 through 3.29 describes the delivery system type currently being utilized in each city in the County.

- System 1: the providers in System 1 have fire department personnel who are used full time for emergency medical services. The fire department engine company nearest to the EMS incident is sent on all EMS runs to provide additional manpower and to reduce response times. System 1 operations have EMS vehicles with transport capability. However, private ambulance companies are used for 70% to 99% of the transportation workload.
- System 2: these providers use fire department personnel full time for EMS incidents, and engine companies are sent on all EMS runs. The EMS vehicles have transport capability and, as opposed to System 1, are used for all transports.
- System 3: the providers employing this system also use fire department personnel full time to service EMS incidents. This system differs from Systems 1 and 2 in that the engine companies are not normally sent on all EMS runs. Fire department equipment may be sent to assist on EMS incidents, such as heart problems or other serious medical emergencies, when deemed necessary

by the fire department dispatcher. The EMS vehicles have transport capability and are used to provide 75% to 90% of the transports. Private ambulance companies are used for the remainder of the transportation workload.

- System 4: these providers use full-time fire personnel; and, unlike System 2, engine companies are not sent as a matter of normal policy on all EMS runs. The response units have transport capability and perform all such work. The City of Los Angeles is an example of this delivery system type.
- System 5: these providers use fire personnel full time, and engine companies are not normally sent to all EMS incidents. Unlike System 3, the EMS vehicles do not have transport capability, and private ambulance companies are used to provide all transports.
- System 6: the System 6 providers are characterized by dual-role personnel who perform both fire and EMS duties. They may respond as part of a fire unit or may be assigned to a rescue ambulance or rescue squad vehicle. The engine company closest to the scene is sent on all runs along with the emergency medical personnel. The EMS vehicles do not have transport capability and private ambulance companies are used to provide all transport services. The Los Angeles County Fire Department is an example of this type of delivery system.
- System 7: the providers employing this system use dual-role fire fighter personnel to service EMS incidents, but engine companies are not sent on all EMS runs as a matter of normal policy. The system uses private transportation for 85% to 99% of the runs requiring transport, but the primary response units also have transport capability. System 7 is similar to System 2, except that fire department personnel are not dedicated solely to EMS.
- System 8: System 8 is similar to System 4, except that fire personnel are used in a dual role. The EMS vehicles perform all transports, and private ambulance companies are not used except perhaps as a backup. Engine companies are not sent on all runs as a normal operating policy.

- System 9: the providers using this system utilize private ambulance companies as the primary response units. One provider has drawn up a specific contract between itself and two ambulance companies to provide emergency medical services for a specific amount of money and at specific locations. The other provider calls the ambulance company when necessary, and depends upon it to provide services with reimbursement made through the Emergency Aid Program.
- System 10: the providers using this system also make use of private ambulance companies as EMS providers. However, these operations normally dispatch their own fire department response units either at the same time that they call the private ambulance company or before the private ambulance company is called. In the latter case, the ambulance company is usually requested after the arrival of the local fire department unit at the scene of the emergency.
- System 11: this system has an operational configuration using both an engine company and a rescue squad unit independently as a two-unit system. This type of operation has characteristics common to several of the other kinds of systems, but the combination is unique.
- System 12: there are two examples of this delivery system in the County. Both use engine companies as primary response units and private ambulance companies for transport. However, one of these two providers is actually part of a larger system: three of the engine companies within the County Fire Department, because of their locations and the locations of the nearest rescue units, have been made EMT I level response units and may respond without a rescue squad. The other provider is the City of Santa Monica, which uses engine companies as EMS response units, with private ambulances providing transportation.
- System 13: System 13 is the Avalon fire, rescue, and emergency medical system. Avalon uses a combination of full-time fire personnel and volunteer ambulance attendants to provide its services.
- System 14: System 14 is the Sierra Madre Fire Department which uses only volunteers.

- System 15: System 15 represents the contractual relationship between the cities of South Pasadena and Pasadena for emergency medical services. As a part of the contract, South Pasadena provides an ambulance vehicle and space at a fire station and pays a fee for service. The unit is staffed with personnel paid by and dispatched via the Pasadena Fire Department.

As shown in Exhibit 3-I, there were approximately 285,000 EMS incidents and 132 primary response units in the County in 1975. System 4 and System 6 (Los Angeles City- and Los Angeles County-types) accounted for over 70% of the responses and over 60% of the response units. Table B shows the 1975 percentage of response units and incident responses by system type. Additional statistics can be derived from the information contained in Exhibit 3-I:

- Full-time EMS personnel staffed 55% of the response units and responded to 64% of the incidents.
- Dual-role personnel were used in 31% of the vehicles and made 26% of the runs.
- Private contractors provided 9% of the vehicles and made 5% of the runs.
- Systems in which engine companies were selectively dispatched (rather than being dispatched for all runs) accounted for 67% of all runs made during 1975.

TABLE B

<u>System Number</u>	<u>Percent of EMS Units</u>	<u>Percent of Total Runs</u>
1	5	4
2	6	6
3	2	1
4	38	52
5	3	2
6	25	21
7	3	2
8	2	1
9	4	2
10	5	3
11	2	1
12	5	2
13-15	2	0
Other	-	3

1975 PERFORMANCE DATA

Performance statistics were computed for each of the primary EMS providers in the County and for the County as a whole. Exhibits 3-K and 3-L on pages 3.30 and 3.31 illustrate the distribution of countywide response and service times.

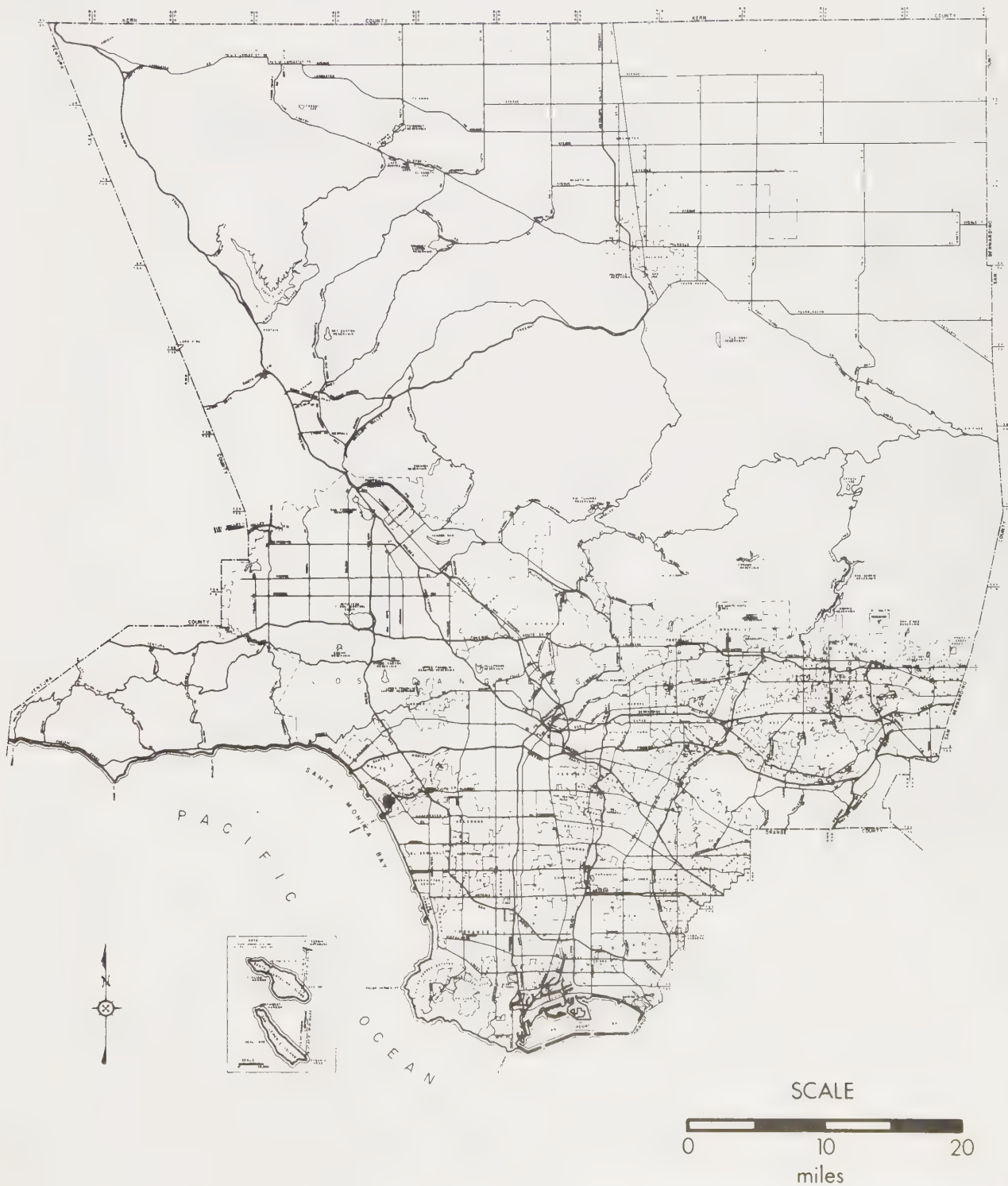
- Average response time: the primary providers in the County averaged a response time of 5.2 minutes for incidents during 1975. Approximately 34% of their responses were under five minutes, and 92% were less than ten minutes.
- Average service time: during 1975, the countywide average service time was 21.0 minutes. The majority of these runs (86.4%) was completed in less than forty minutes and 55% were completed in less than twenty minutes.

An average countywide response time is useful for evaluating overall performance, but it is not useful for estimating the service level provided in specific areas or for identifying individual performance problems. For example, Exhibit 3-M on page 3.32 shows the distribution of response times for the City of Los Angeles. As shown in Exhibit 3-N on page 3.33, the response times vary by fire department battalion area from a low of 4.6 minutes to a high of 7.7 minutes. These variations are caused by several factors, including workload per unit, geographical constraints, amount of backup by other units, and the location of hospitals.

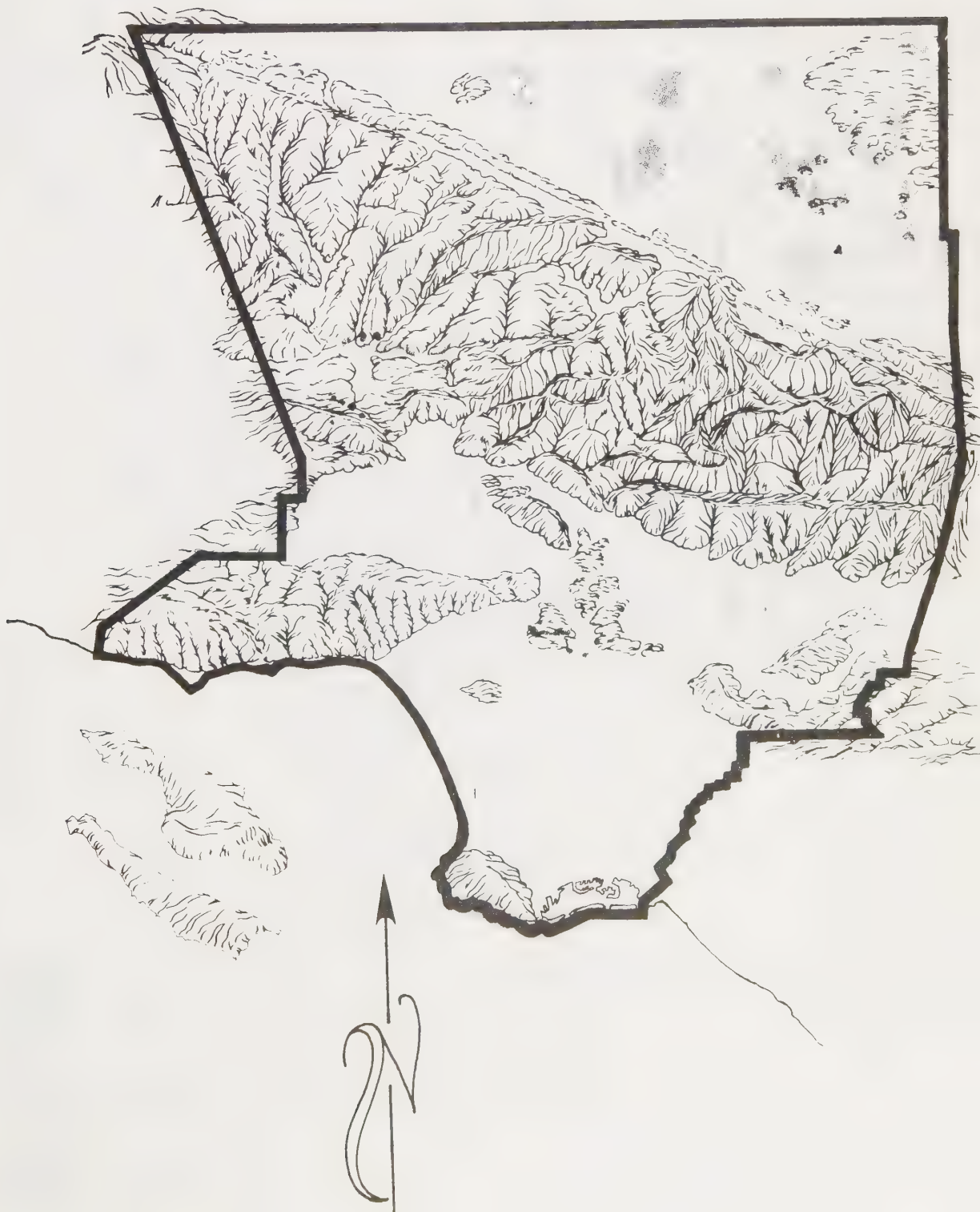
Similar performance differences occurred when response times were analyzed for areas serviced by the County Fire Department. Exhibit 3-O on page 3.34 illustrates the overall response time distribution for the County Fire Department. Exhibit 3-P on page 3.35 is an analysis of the response patterns in each of the three County dispatch areas. The large land area and mountainous terrain in the Antelope Valley have a definite negative impact on performance. The Los Angeles dispatch area had response times similar to that of the City Fire Department.

Another example of the variation in County Fire response can be determined by analyzing the response time performance of fire engines which are dispatched to all EMS incidents. Although additional manpower may be required at the scene due to the nature of the emergency, the major justification for dispatching engines on all responses is to improve response time. Exhibit 3-Q on page 3.36 shows the engine response time by County dispatch area. In the Los Angeles area, which accounts for 65% of the County Fire EMS incidents, the engine response performance is not significantly better than the EMS squad performance shown in Exhibit 3-P. In the Antelope Valley, however, dispatching engines significantly improved the County Fire response time.

LOS ANGELES COUNTY

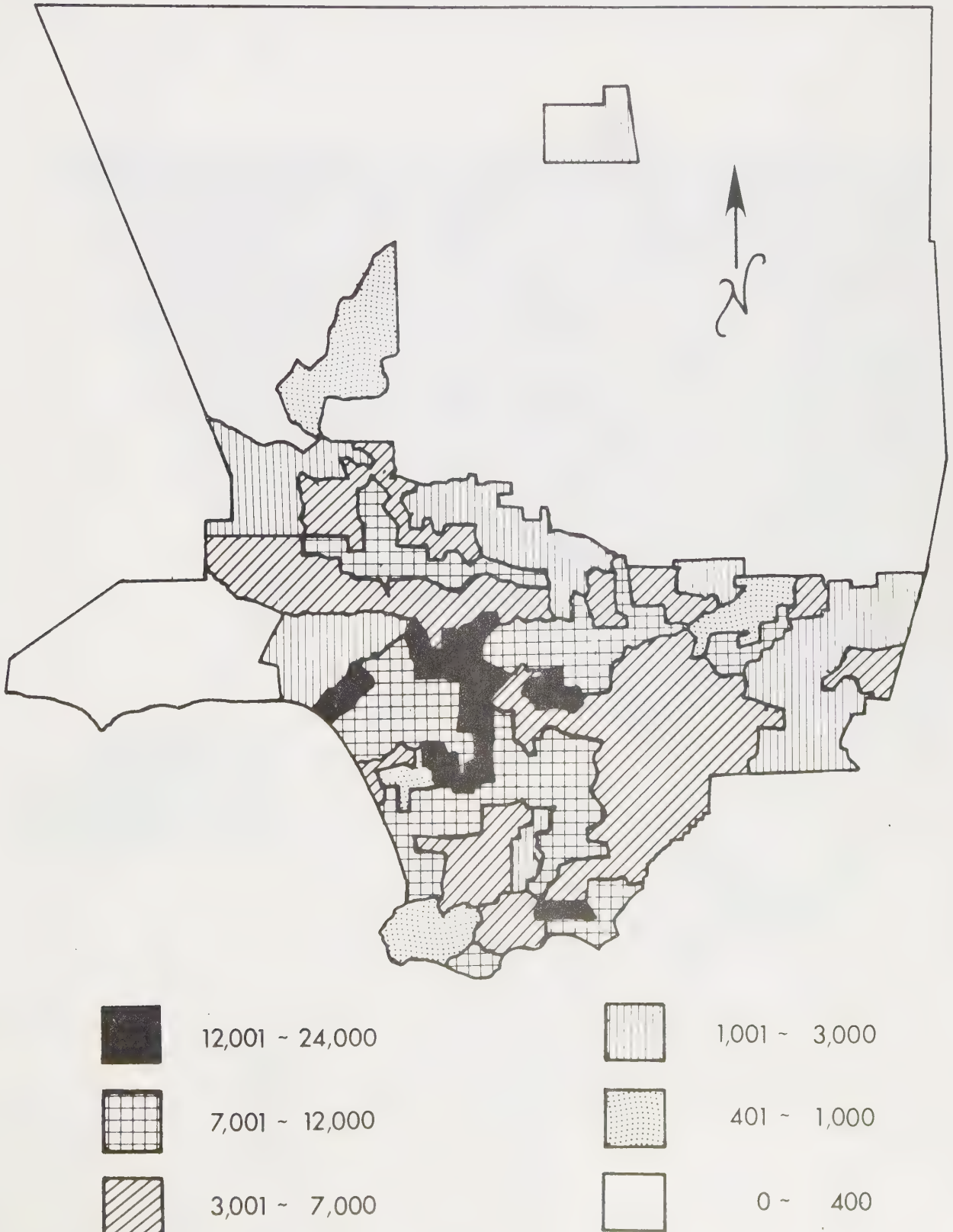


LOS ANGELES COUNTY TOPOGRAPHY



LOS ANGELES COUNTY POPULATION DENSITY

POP. / SQ. MILE



UNINCORPORATED AREAS IN LOS ANGELES COUNTY



EMS OPERATING CHARACTERISTICSPROVIDERS AND PERSONNEL

JURISDICTION	TYPE OF SERVICE	PROVIDERS	TOTAL PROVIDER PERSONNEL	HIGHEST EMS TRAINING LEVEL			PRIMARY RESPONSE STATIONS	AREA PER PRIMARY RESPONSE STATION	POPULATION PER PRIMARY RESPONSE STATION
				FA/CPR	EMT I	EMT II			
ALHAMBRA	E/R/T	FD	87	65	15	0	2	3.8	30,177
ARCADIA	P/R/T	FD	57	18	16	9	3	3.8	15,467
AVALON	E/R/T	FD	23	18	5 ¹	0	1	74.0 ²	1,888
AZUSA	R	FD	30	22	8	-	2	3.8	12,199
	P/T	PAC	-	-	-	6	-		
BEVERLY HILLS	P/R/T	FD	88	71	0	12	1	5.7	32,254
BURBANK	P/R/T	FD	125	108	4	13	6	2.9	13,854
	T	PAC	-	-	-	-	-		
COMPTON	E/R	FD	89	12	73 ³	0	4	2.4	18,185
	T	PAC	-	-	-	-	-		
COVINA	P/R	FD	52	33	8	9	3	2.1	10,943
	T	PAC	-	-	-	-	-		
CULVER CITY	P/R/T	FD	71	52	-	9	1	4.9	38,053
	T	PAC	-	-	-	-	-		
¹ 8 other EMT I's available as needed as volunteers ² Includes unincorporated area of Santa Catalina ³ Approximate									

KEY: PROVIDERS

- . FD - Fire Department
- . PAC - Private Ambulance Co.

KEY: TYPE OF SERVICE

- . P - Paramedic
- . R - Rescue and Salvage
- . T - Transport
- . E - EMT I
- . FA - Advanced First Aid

EMS OPERATING CHARACTERISTICS

PROVIDERS AND PERSONNEL

JURISDICTION	TYPE OF SERVICE	PROVIDERS	TOTAL PROVIDER PERSONNEL	HIGHEST EMS TRAINING LEVEL			PRIMARY RESPONSE STATIONS	AREA PER PRIMARY RESPONSE STATION	POPULATION PER PRIMARY RESPONSE STATION
				FA/CPR	EMT I	EMT II			
DOWNEY	P/R/T T	FD PAC	86	-	60	10	4	3.2	22,143
EL MONTE	E/R P/T	FD PAC	30 -	18 -	10 6	0 6	2	4.7	33,277
EL SEGUNDO	P/R/T T	FD PAC	62	53	-	8	1	5.5	14,820
GARDENA	P/R/T	FD	60	45	-	9	2	2.6	21,671
GLENDAL	P/T R	PAC FD	- 191	- 100	- -	18 ¹ -	2 9	14.7	66,410
HAWTHORNE	P/R/T	FD	61	44	-	9	3	1.9	18,640
HERMOSA BEACH	E/R/T T	FD PAC	18 -	14 -	4 -	- -	1	1.4	18,461
INGLEWOOD	P/R/T	FD	108	77	-	23	3	3.0	27,983
LA VERNE	E/R P/T	FD PAC	13 -	6 -	6 -	0 6	3	2.4	5,226
LONG BEACH	P/R/T	FD	473	405	-	45	18	2.8	19,259
¹ PAC's located in Glendale. Other EMT II's & I's available as needed for emergency service. 18 is the contractual requirement.									

KEY: PROVIDERS

- . FD - Fire Department
- . PAC - Private Ambulance Co.

KEY: TYPE OF SERVICE

- . P - Paramedic
- . R - Rescue and Salvage
- . T - Transport
- . E - EMT I
- . FA - Advanced First Aid

EMS OPERATING CHARACTERISTICSPROVIDERS AND PERSONNEL

JURISDICTION	TYPE OF SERVICE	PROVIDERS	TOTAL PROVIDER PERSONNEL	HIGHEST EMS TRAINING LEVEL			PRIMARY RESPONSE STATIONS	AREA PER PRIMARY RESPONSE STATION	POPULATION PER PRIMARY RESPONSE STATION
				FA/CPR	EMT I	EMT II			
LOS ANGELES (CITY)	P/R/T	FD	3,530	2,632	97	187	39	11.9	70,836
LOS ANGELES COUNTY	P/R T	FD PAC	2,365 -	1,950 ¹ -	100 ¹ -	350 -	132	16.6	15,348
LYNWOOD	FA/R T	FD PAC	36 -	17 -	19 -	0 -	2	2.4	21,127
MANHATTAN BEACH	P/R/T T	FD PAC	36 -	21 -	5 ¹ -	10 -	1	3.8	33,279
MONROVIA	P/R T	FD PAC	40 -	20 -	3 -	7 -	1	13.7	29,229
MONTEBELLO	P/R T	FD PAC	63 -	35 -	0 -	15 -	2	4.2	22,842
MONTEREY PARK	P/T FA/R	PAC FD	- 42	- 25	- 15	6 0	1	7.3	49,383
PALOS VERDES ESTATES	FA/R T	FD PAC	17 -	13 -	4 ² -	0 -	1	4.8	14,255
PASADENA/SO. PASADENA	P/R/T	FD	189	-	-	22	3	8.8	45,385

¹Approximate
²3 of the 4 EMT I's are officers and are not part of the regular rescue rotation.

KEY: PROVIDERS

- . FD - Fire Department
- . PAC - Private Ambulance Co.

KEY: TYPE OF SERVICE

- . P - Paramedic
- . R - Rescue and Salvage
- . T - Transport
- . E - EMT I
- . FA - Advanced First Aid

EMS OPERATING CHARACTERISTICSPROVIDERS AND PERSONNEL

JURISDICTION	TYPE OF SERVICE	PROVIDERS	TOTAL PROVIDER PERSONNEL	HIGHEST EMS TRAINING LEVEL			PRIMARY RESPONSE STATIONS	AREA PER PRIMARY RESPONSE STATION	POPULATION PER PRIMARY RESPONSE STATION
				FA/CPR	EMT I	EMT II			
POMONA	FA/R P/T	FD PAC	111 -	103 -	8 -	- -	6	3.8	13,599
REDONDO BEACH	P/R/T T	FD PAC	73 -	0 -	50 -	18 -	2	3.1	32,071
SAN FERNANDO	E/R/T	FD	24	0	20 ¹	0	1	2.4	15,565
SAN GABRIEL	E/R/T	FD	36	14	19	0	2	2.1	14,940
SAN MARINO	E/R/T	FD	23	13	9	0	1	3.8	13,893
SANTA FE SPRINGS	P/R/T T	FD PAC	67 -	0 -	48 ¹ -	10 -	4	2.2	4,106
SANTA MONICA	P/R T	FD PAC	100 -	62 ¹ -	0 -	22 -	3	2.7	30,554
SIERRA MADRE	E/R T	Vol. FD PAC	32 -	15 -	6 -	0 -	1	2.9	12,184
TORRANCE	P/R T	FD PAC	159 -	130 -	- -	19 -	2	10.2	67,556
¹ Estimated									

KEY: PROVIDERS

- . FD - Fire Department
- . PAC - Private Ambulance Co.

KEY: TYPE OF SERVICE

- . P - Paramedic
- . R - Rescue and Salvage
- . T - Transport
- . E - EMT I
- . FA - Advanced First Aid

EMS OPERATING CHARACTERISTICSPROVIDERS AND PERSONNEL

JURISDICTION	TYPE OF SERVICE	PROVIDERS	TOTAL PROVIDER PERSONNEL	HIGHEST EMS TRAINING LEVEL			PRIMARY RESPONSE STATIONS	AREA PER PRIMARY RESPONSE STATION	POPULATION PER PRIMARY RESPONSE STATION
				FA/CPR	EMT I	EMT II			
VERNON	P/R/T T	FD PAC	114 -	93 -	10 -	9 -	4	1.3	61
WEST COVINA	P/R T	FD PAC	72 -	59 -	0 -	10 -	5	3.0	14,476

KEY: PROVIDERS

. FD - Fire Department
. PAC - Private Ambulance Co.

KEY: TYPE OF SERVICE

. P - Paramedic
. R - Rescue and Salvage
. T - Transport
. E - EMT I
. FA - Advanced First Aid

EMS OPERATING CHARACTERISTICSVEHICLES AND OPERATIONS

JURISDICTION	PRIMARY RESPONSE VEHICLES				TRANSPORT CAPACITY	EMS RUNS PER YEAR (APPROX.)	% RESULTING IN TRANSPORTS	% OF TRANSPORTS MADE BY JURISDICTION	BACK-UP UNITS		
	TYPE	NO.	PERSONNEL PER VEHICLE	VEHICLES PER RESPONSE					PROVIDER	NO.	TYPE
ALHAMBRA	Van	2	2	1	Yes	2,500	68	100	OFD	A/N	Van
ARCADIA	Van	1	2	1	Yes	1,600	72	100	OFD	A/N	Van (P/R)
	Engine	3	3-4	1	No				PAC	A/N	Van (T)
AVALON	Van	1	1 ¹	1	Yes	250	95 ²	100	FD	1 1	Van Pickup
AZUSA	Pickup	1	2	1	No	1,400	Unavail.	0	PAC	A/N	Van
	Van (PAC)	1	2	1	Yes				FD	1	Engine
BEVERLY HILLS	Cadillac	2	2	1	Yes	1,800	64	95	FD	1	Engine
BURBANK	Van	1	2	1	Yes	2,200	80	5	FD	1	Engine
	Engine	6	3	1	No				PAC	A/N	Van
COMPTON	Squad	1	2	1 or	No	1,600	50	0	FD	1	Engine
	Engine	3	4	1	No						
COVINA	Squad	1	2	1	No	1,000	49	0			
	Engine	3	3-4	1	No						
CULVER CITY	Van	1	2	1	Yes	1,600	70	20	FD	3	Engine
¹ Responds with a Sheriff's deputy FA/CPR trained											
² Approximation											

¹ Responds with a Sheriff's deputy FA/CPR trained

² Approximation

KEY: BACKUP UNITS

- . OFD - Other Fire Departments
- . A/N - As Necessary
- . PAC - Private Ambulance Co.
- . FD - Fire Department

EMS OPERATING CHARACTERISTICSVEHICLES AND OPERATIONS

JURISDICTION	PRIMARY RESPONSE VEHICLES				TRANSPORT CAPACITY	EMS RUNS PER YEAR (APPROX.)	% RESULTING IN TRANSPORTS	% OF TRANSPORTS MADE BY JURISDICTION	BACK-UP UNITS		
	TYPE	NO.	PERSONNEL PER VEHICLE	VEHICLES PER RESPONSE					PROVIDER	NO.	TYPE
DOWNEY	Van Engine	1 4	2 3-5	1 1	Yes No	2,200	75	25	FD OFD	1 A/N	Engine Van Engine
EL MONTE	Van (PAC) Van	2 1	2 2	1 1	Yes Yes	2,500	Unavail.	0	PAC FD	A/N 3	Van Engine
EL SEGUNDO	Van	1	2	1	Yes	1,000	75	95	FD	3	Engine
GARDENA	Van Engine	1 2	2 2-4	1 1	Yes No	1,800	62	100	FD PAC	1 A/N	Engine Van (T)
GLENDALE	Van (PAC)	3	2	1	Yes	4,200	70	0	PAC FD	A/N 9	Various Engine
HAWTHORNE	Van Engine Truck	1 2 1	2 3 3	1 1 or ¹ 1	Yes	2,000	85	30	FD PAC	1 1 A/N	Engine Truck Paramedic
HERMOSA BEACH	Van	1	2	1	Yes	800	66	1	FD	1	Engine
INGLEWOOD	Van	3	2	1	Yes	4,500	50	2	FD	5 1	Engine Truck
LA VERNE	Van (PAC) Engine	1 2	2 2-3	1 1	Yes No	200	90	0	PAC FD	A/N 3	Van/Cad. Engine

¹ Either an engine or a truck company responds with the van

KEY: BACKUP UNITS

- . OFD - Other Fire Departments
- . A/N - As Necessary
- . PAC - Private Ambulance Co.
- . FD - Fire Department

EMS OPERATING CHARACTERISTICSVEHICLES AND OPERATIONS

JURISDICTION	PRIMARY RESPONSE VEHICLES				TRANSPORT CAPACITY	EMS RUNS PER YEAR (APPROX)	% RESULTING IN TRANSPORTS	% OF TRANSPORTS MADE BY JURISDICTION	BACK-UP UNITS		
	TYPE	NO	PERSONNEL PER VEHICLE	VEHICLES PER RESPONSE					PROVIDER	NO	TYPE
LONG BEACH	Modular Engine	6 18	2 5	1 1	Yes No	12,750	65	100	FD	1	Modular
LOS ANGELES (CITY)	Van	39	2	1	Yes	134,184	46	100	FD	19 57	Van Engine
LOS ANGELES COUNTY	Squad Engine	31 145	2 3-4	1 ¹ 1	No No	57,733	60	0	-	-	-
LYNWOOD	Squad Engine	1 1	2 4	1 or both	No No	1,650	85	0	FD	1-2	Engine
MANHATTAN BEACH	Van	1	2	1	Yes	1,100	30	75	FD	1	Engine
MONROVIA	Squad Engine	1 1	2 2-4	1 1	No No	1,800	33	0	OFD PAC	1 1	Van Van
MONTEBELLO	Squad Engine	1 1	2 3-4	1 or both	No No	1,900	91	0	FD	2	Engine
MONTEREY PARK	Van (PAC)	2	2	1	Yes	2,300	Unavail.	0	FD PAC	3 A/N	Engine Van
PALOS VERDES ESTATES	Pickup Engine	1 1	2 2	1 1	No No	275	75	0	FD	1	Engine
¹ 3 engine companies are EMT I and may respond without a squad											

KEY: BACKUP UNITS

- . OFD - Other Fire Departments
- . PAC - Private Ambulance Co.
- . A/N - As Necessary
- . FD - Fire Department

EMS OPERATING CHARACTERISTICSVEHICLES AND OPERATIONS

JURISDICTION	PRIMARY RESPONSE VEHICLES				TRANSPORT CAPACITY	EMS RUNS PER YEAR (APPROX.)	% RESULTING IN TRANSPORTS	% OF TRANSPORTS MADE BY JURISDICTION	BACK-UP UNITS		
	TYPE	NO.	PERSONNEL PER VEHICLE	VEHICLES PER RESPONSE					PROVIDER	NO.	TYPE
VERNON	Van Engine	1 4	2 4-5	1 1	Yes No	550	90	5	-	-	-
WEST COVINA	Van Engine	1 5	2 3-4	1 1	Yes No	1,600	70	0	OFD	A/N	Van

KEY: BACKUP UNITS

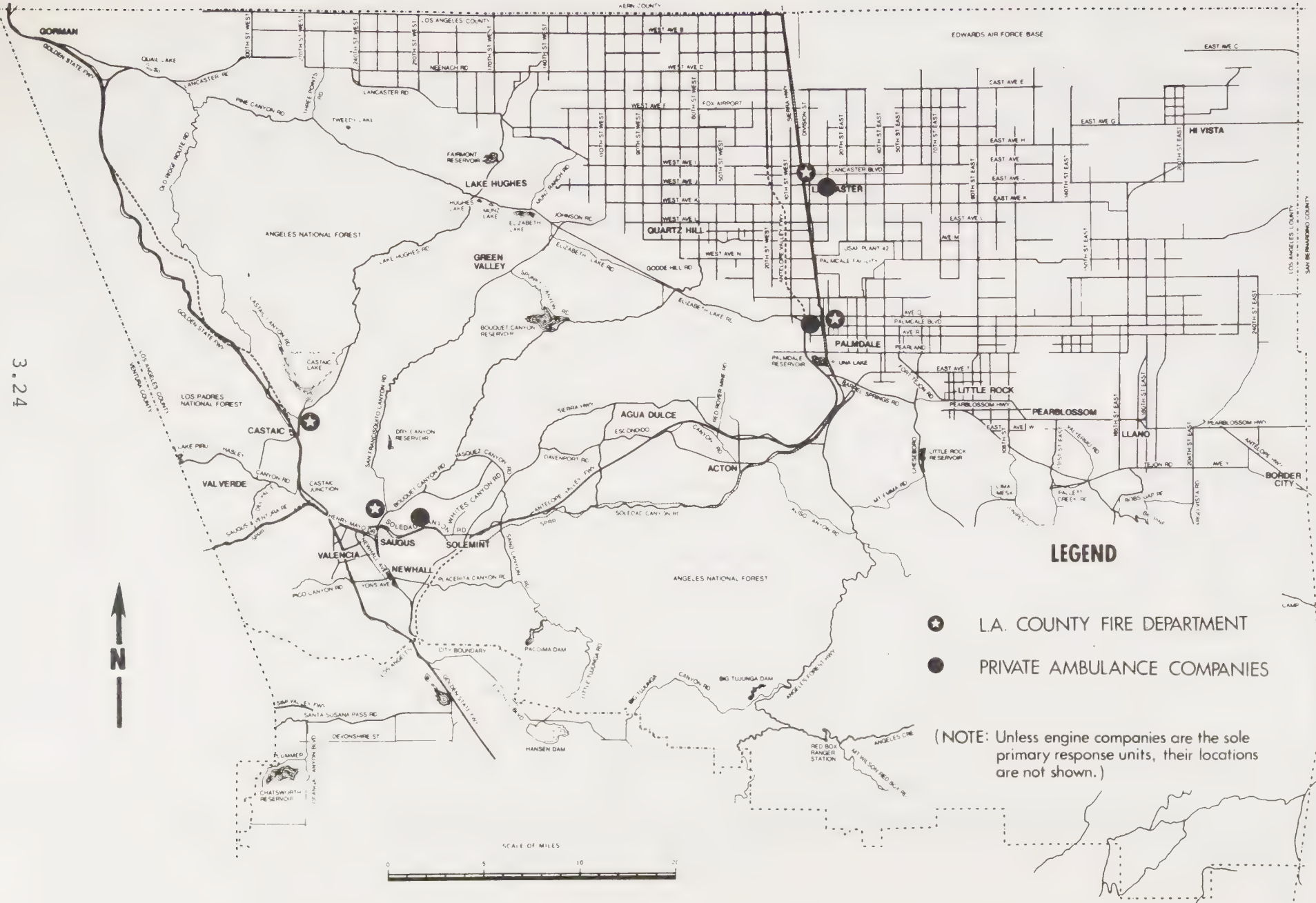
- . OFD - Other Fire Departments . PAC - Private Ambulance Co.
- . A/N - As Necessary . FD - Fire Department

EMERGENCY MEDICAL SERVICES – RESPONSE LOCATIONS



EMERGENCY MEDICAL SERVICES — RESPONSE LOCATIONS

3.24



SUMMARY DESCRIPTION OF EMS DELIVERY SYSTEMS

(PART I)

SYSTEM NUMBER	PRIMARY PROVIDERS WITH THIS CONFIGURATION	PRIMARY RESPONSE UNITS	ESTIMATED 1975 VOLUME	CONFIGURATION DESCRIPTION			
				MANPOWER FOR EMS RESPONSE UNIT ?	ENGINE CO.s SENT ON ALL RUNS ?	EMS VEHICLE USED FOR TRANSPORT ?	PRIVATE AMBU - LANCE CO.s USED ?
1	7	7	10,750	FULL-TIME	YES	YES	TRANSPORT
2	3	8	16,150	FULL-TIME	YES	YES	No
3	2	2	2,100	FULL-TIME	No	YES	TRANSPORT
4	7 ¹	50	148,284	FULL-TIME	No	YES	No
5	3	4	6,750	FULL-TIME	No	No	TRANSPORT
6	3 ²	33	59,008	DUAL-ROLE	YES	No	TRANSPORT
7	3	4	5,100	DUAL-ROLE	No	YES	TRANSPORT
8	2	3	2,850	DUAL-ROLE	No	YES	No
9	2	5	6,500	-	No	-	EMS
10	4	6	9,600	-	YES	-	EMS
SUBTOTAL	36	122	267,092	-	-	-	-

¹ ONE OF THESE OPERATIONS IS ALSO INCLUDED IN SYSTEM 15

² ONE OF THESE OPERATIONS IS ALSO INCLUDED IN SYSTEM 12

SUMMARY DESCRIPTION OF EMS DELIVERY SYSTEMS

(PART II)

3.26

SYSTEM NUMBER	PRIMARY PROVIDERS WITH THIS CONFIGURATION	PRIMARY RESPONSE UNITS	ESTIMATED 1975 VOLUME	DESCRIPTION
11	1	2	1,900	ENGINE COMPANY AND SQUAD UNIT USED SEPARATELY AS A TWO-UNIT SYSTEM WITH PRIVATE AMBULANCE FOR TRANSPORT
12	2 ¹	6	4,500	ENGINE COMPANY USED AS PRIMARY RESPONSE UNIT WITH PRIVATE AMBULANCE FOR TRANSPORT
13	1	1	250	FIRE AND VOLUNTEER AMBULANCE SYSTEM
14	1	1	300	VOLUNTEER RESCUE OPERATION
15	1	-	-	SOUTH PASADENA CONTRACT WITH PASADENA FOR EMS SERVICES
-	-	-	12,000	RUNS MADE BY PROVIDERS BUT NOT ASSIGNABLE TO A PARTICULAR SYSTEM
SUBTOTAL	6	10	18,950	
GRAND TOTAL	40 ²	132	286,042	

¹ ONE OF THESE OPERATIONS IS PART (3 UNITS) OF A LARGER OPERATION INCLUDED IN SYSTEM 6

² COLUMN ACTUALLY TOTALS TO 42, BUT 2 OPERATIONS ARE DOUBLY COUNTED

EMS DELIVERY SYSTEMS

OPERATIONAL SUMMARY

CITY	SYSTEM NUMBER	EMS SERVICE PROVIDED BY LOS ANGELES COUNTY FIRE DEPARTMENT	MANPOWER FOR EMS RESPONSE UNITS	ENGINE COMPANIES SENT ON ALL RUNS	EMS VEHICLE USED FOR TRANSPORT	PRIVATE AMBULANCE COMPANIES USED FOR TRANSPORT	OTHER
		(YES — NO)	(FULL-TIME — DUAL-ROLE)	(YES — NO)	(YES — NO)	(YES — NO)	
ALHAMBRA	8	No	DUAL-ROLE	No	YES	No	VOLUNTEER RESCUE OPERATION CONTRACT WITH PRIVATE AMBULANCE COMPANY FOR EMS SERVICES
ARCADIA	2	No	FULL-TIME	YES	YES	No	
ARTESIA	6	YES	DUAL-ROLE	YES	No	YES	
AVALON	14	No	-	No	YES	No	
AZUSA	10	No	-	YES	-	YES	
BALDWIN PARK	6	YES	DUAL-ROLE	YES	No	YES	
BELL	6	YES	DUAL-ROLE	YES	No	YES	
BELLFLOWER	6	YES	DUAL-ROLE	YES	No	YES	
BELL GARDENS	6	YES	DUAL-ROLE	YES	No	YES	
BEVERLY HILLS	4	No	FULL-TIME	No	YES	No	
BRADBURY	6	YES	DUAL-ROLE	YES	No	YES	
BURBANK	1	No	FULL-TIME	YES	YES	YES	
CARSON	6	YES	DUAL-ROLE	YES	No	YES	
CERRITOS	6	YES	DUAL-ROLE	YES	No	YES	
CLAREMONT	6	YES	DUAL-ROLE	YES	No	YES	
COMMERCE	6	YES	DUAL-ROLE	YES	No	YES	
COMPTON	5	No	FULL-TIME	No	No	YES	
COVINA	1	No	FULL-TIME	YES	YES	YES	
CUDAHY	6	YES	DUAL-ROLE	YES	No	YES	
CULVER CITY	7	No	DUAL-ROLE	No	YES	YES	
DOWNEY	1	No	FULL-TIME	YES	YES	YES	CONTRACT WITH PRIVATE AMBULANCE COMPANY FOR EMS SERVICES
DUARTE	6	YES	DUAL-ROLE	YES	No	YES	
EL MONTE	10	No	-	YES	-	YES	
EL SEGUNDO	3	No	FULL-TIME	No	YES	YES	
GARDENA	2	No	FULL-TIME	YES	YES	No	
GLENDALE	9	No	-	No	-	YES	CONTRACT WITH PRIVATE AMBULANCE COMPANIES FOR EMS SERVICES
GLENDORA	6	YES	DUAL-ROLE	YES	No	YES	

EMS DELIVERY SYSTEMS

OPERATIONAL SUMMARY

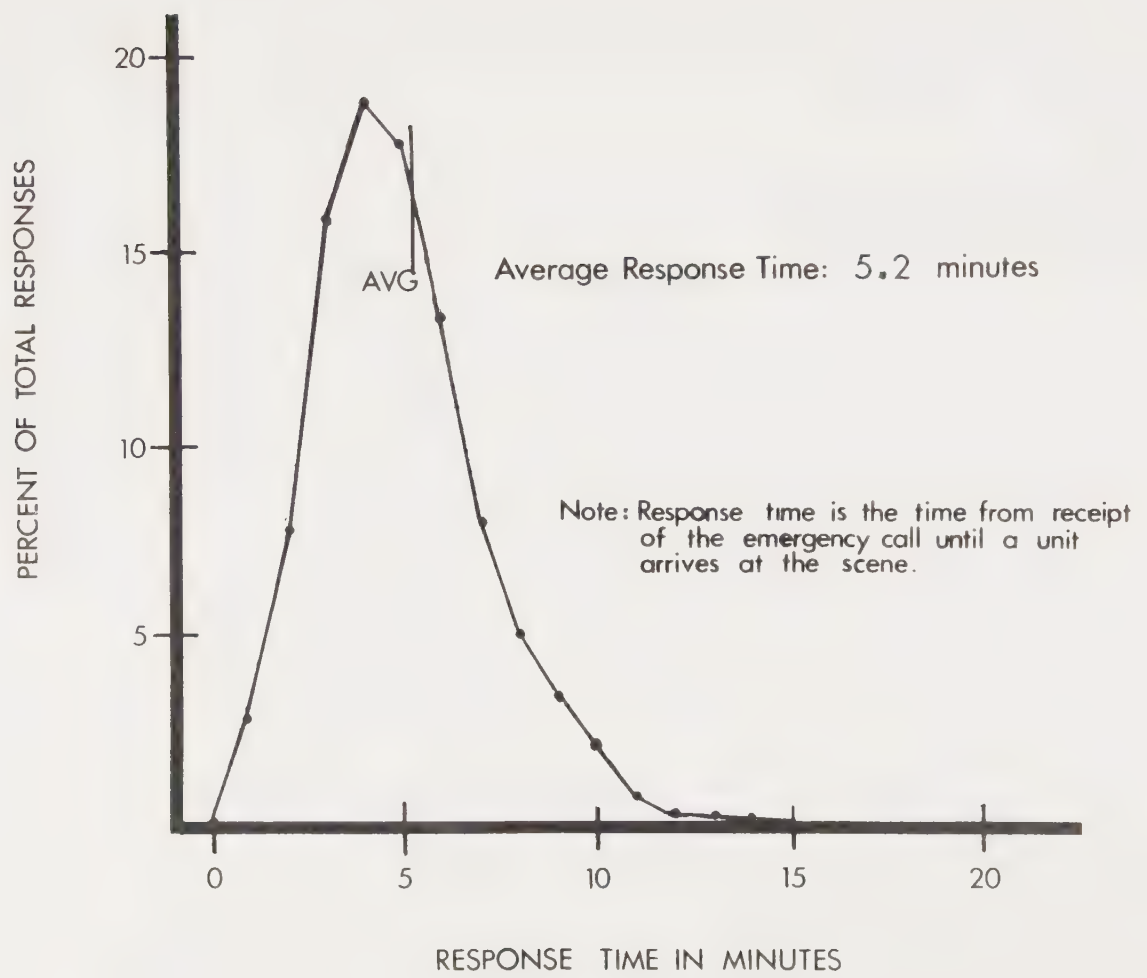
CITY	SYSTEM NUMBER	EMS SERVICE PROVIDED BY LOS ANGELES COUNTY FIRE DEPARTMENT	MANPOWER FOR EMS RESPONSE UNITS	ENGINE COMPANIES SENT ON ALL RUNS	EMS VEHICLES USED FOR TRANSPORT	PRIVATE AMBULANCE COMPANIES USED FOR TRANSPORT	OTHER
		(YES — NO)	(FULL-TIME — DUAL-ROLE)	(YES — NO)	(YES — NO)	(YES — NO)	
HAWAIIAN GARDENS	6	YES	DUAL-ROLE	YES	NO	YES	
HAWTHORNE	1	NO	FULL-TIME	YES	YES	YES	
HERMOSA BEACH	7	NO	DUAL-ROLE	NO	YES	YES	
HIDDEN HILLS	6	YES	DUAL-ROLE	YES	NO	YES	
HUNTINGTON PARK	6	YES	DUAL-ROLE	YES	NO	YES	
INDUSTRY	6	YES	DUAL-ROLE	YES	NO	YES	
INGLEWOOD	4	NO	FULL-TIME	NO	YES	NO	
IRWINDALE	6	YES	DUAL-ROLE	YES	NO	YES	
LAKEWOOD	6	YES	DUAL-ROLE	YES	NO	YES	
LA MIRADA	6	YES	DUAL-ROLE	YES	NO	YES	
LA PUENTE	6	YES	DUAL-ROLE	YES	NO	YES	
LA VERNE	10	NO	-	YES	-	YES	CONTRACT WITH PRIVATE AMBULANCE COMPANY FOR EMS SERVICES
LAWDALE	6	YES	DUAL-ROLE	YES	NO	YES	
LOMITA	6	YES	DUAL-ROLE	YES	NO	YES	
LONG BEACH	2	NO	FULL-TIME	YES	YES	NO	
LOS ANGELES CITY	4	NO	FULL-TIME	NO	YES	NO	
LYNWOOD	5	NO	FULL-TIME	NO	NO	YES	
MANHATTAN BEACH	3	NO	FULL-TIME	NO	YES	YES	
MAYWOOD	6	YES	DUAL-ROLE	YES	NO	YES	
MONROVIA	6	NO	DUAL-ROLE	YES	NO	YES	
MONTEBELLO	11	NO	DUAL-ROLE	NO	NO	YES	ENGINE COMPANY AND SQUAD USED SEPARATELY AS A TWO-UNIT SYSTEM CONTRACT WITH PRIVATE AMBULANCE COMPANY FOR EMS SERVICES
MONTEREY PARK	9	NO	-	NO	-	YES	
NORWALK	6	YES	DUAL-ROLE	YES	NO	YES	
PALMDALE	6	YES	DUAL-ROLE	YES	NO	YES	
PALOS VERDES EST.	6	NO	DUAL-ROLE	YES	NO	YES	
PARAMOUNT	6	YES	DUAL-ROLE	YES	NO	YES	
PASADENA	4	NO	FULL-TIME	NO	YES	NO	

EMS DELIVERY SYSTEMS

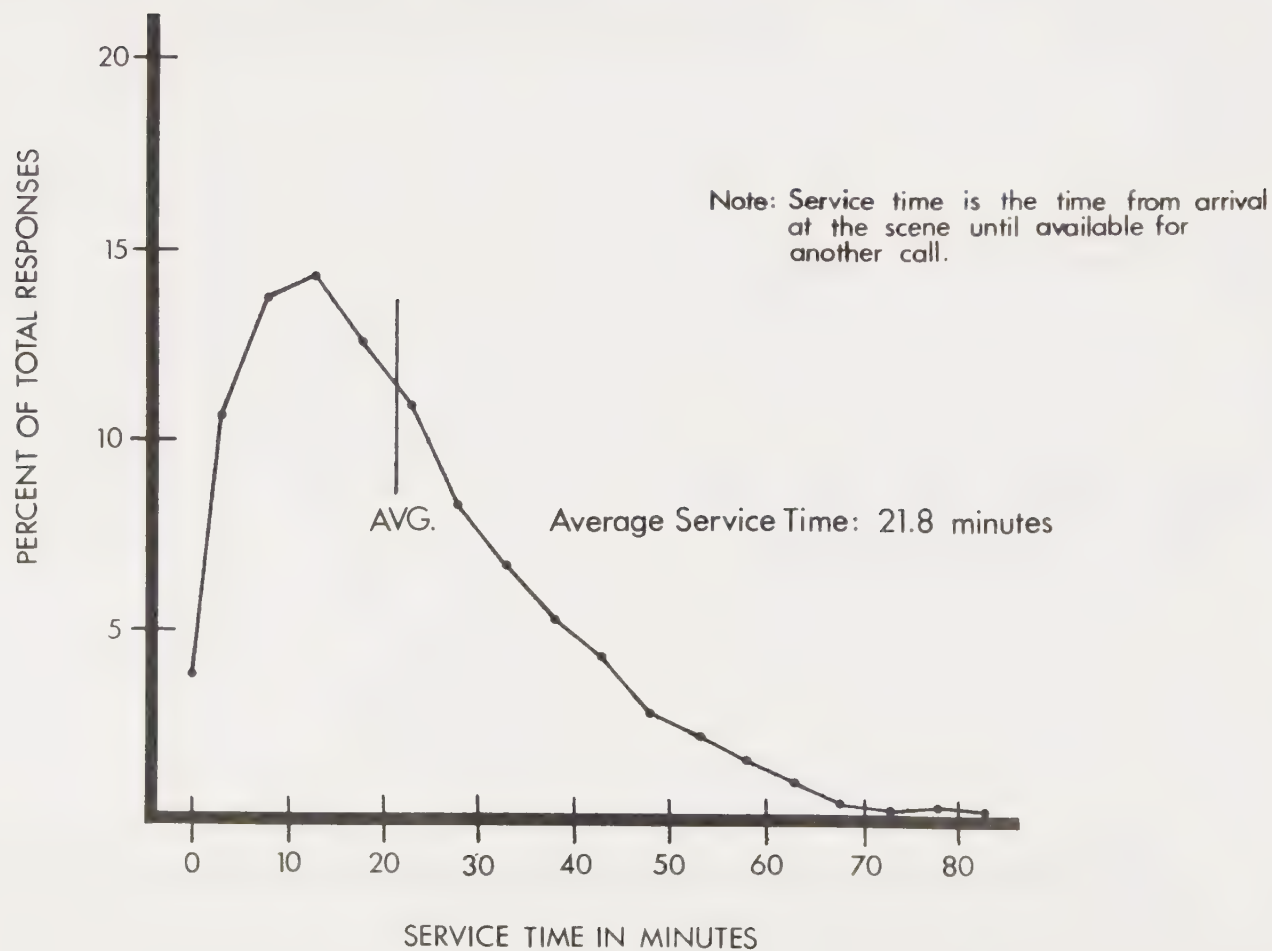
OPERATIONAL SUMMARY

CITY	SYSTEM NUMBER	EMS SERVICE PROVIDED BY LOS ANGELES COUNTY FIRE DEPARTMENT	MANPOWER FOR EMS RESPONSE UNITS	ENGINE COMPANIES SENT ON ALL RUNS	EMS VEHICLE USED FOR TRANSPORT	PRIVATE AMBULANCE COMPANIES USED FOR TRANSPORT	OTHER
		(YES — NO)	(FULL-TIME — DUAL-ROLE)	(YES — NO)	(YES — NO)	(YES — NO)	
PICO RIVERA	6	YES	DUAL-ROLE	YES	NO	YES	CONTRACT WITH PRIVATE AMBULANCE COMPANY FOR EMS SERVICES
POMONA	10	NO	-	YES	-	YES	
RANCHO PALOS VERDES	6	YES	DUAL-ROLE	YES	NO	YES	
REDONDO BEACH	7	NO	DUAL-ROLE	NO	YES	YES	
ROLLING HILLS	6	YES	DUAL-ROLE	YES	NO	YES	
ROLLINGS HILLS EST.	6	YES	DUAL-ROLE	YES	NO	YES	ENGINE COMPANY USED AS PRIMARY RESPONSE UNIT FIRE AND VOLUNTEER AMBULANCE SYSTEM
ROSEMEAD	6	YES	DUAL-ROLE	YES	NO	YES	
SAN DIMAS	6	YES	DUAL-ROLE	YES	NO	YES	
SAN FERNANDO	4	NO	FULL-TIME	NO	YES	NO	
SAN GABRIEL	4	NO	FULL-TIME	NO	YES	NO	
SAN MARINO	8	NO	DUAL-ROLE	NO	YES	NO	
SANTA FE SPRINGS	1	NO	FULL-TIME	YES	YES	YES	
SANTA MONICA	12	NO	DUAL-ROLE	-	NO	YES	
SIERRA MADRE	13	NO	-	NO	NO	YES	
SIGNAL HILL	6	YES	DUAL-ROLE	YES	NO	YES	
SOUTH EL MONTE	6	YES	DUAL-ROLE	YES	NO	YES	CONTRACT WITH CITY OF PASADENA FOR EMS SERVICES
SOUTH GATE	6	YES	DUAL-ROLE	YES	NO	YES	
SOUTH PASADENA	4	NO	FULL-TIME	NO	YES	NO	
TEMPLE CITY	6	YES	DUAL-ROLE	YES	NO	YES	
TORRANCE	5	NO	DUAL-ROLE	NO	NO	YES	
VERNON	1	NO	FULL-TIME	YES	YES	YES	
WALNUT	6	YES	DUAL-ROLE	YES	NO	YES	
WEST COVINA	1	NO	FULL-TIME	YES	YES	YES	
WHITTIER	6	YES	DUAL-ROLE	YES	NO	YES	
LOS ANGELES COUNTY	6	-	DUAL-ROLE	YES	NO	YES	

DISTRIBUTION OF RESPONSE TIMES FOR ALL EMS RUNS IN LOS ANGELES COUNTY



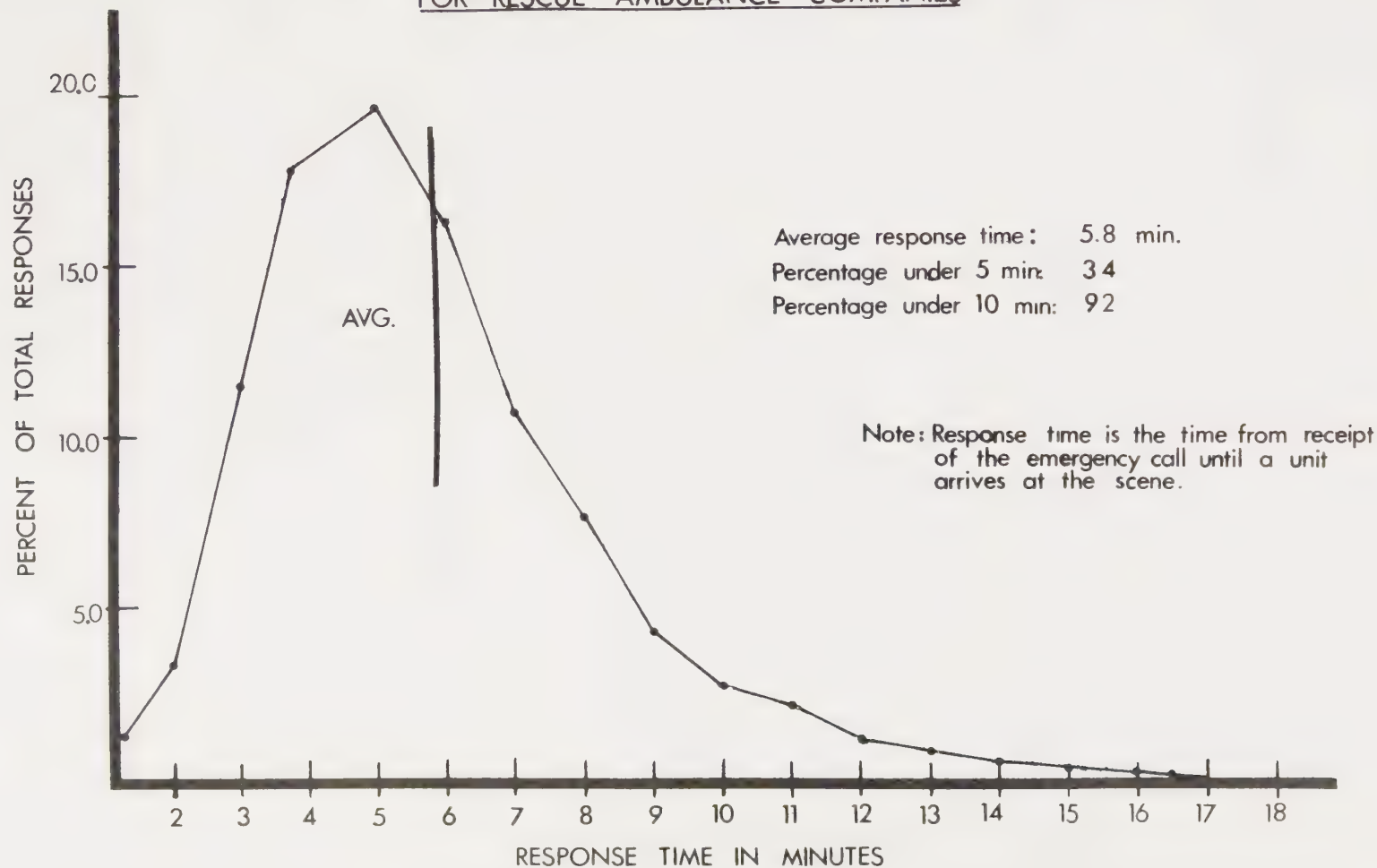
DISTRIBUTION OF SERVICE TIMES
FOR ALL EMS RUNS IN LOS ANGELES COUNTY



LOS ANGELES CITY FIRE DEPARTMENT

RESCUE AMBULANCE SERVICE - OPERATING CHARACTERISTICS

DISTRIBUTION OF RESPONSE TIMES FOR RESCUE AMBULANCE COMPANIES



SUMMARY OF LOS ANGELES CITY
FIRE DEPARTMENT BATTALION STATISTICS¹

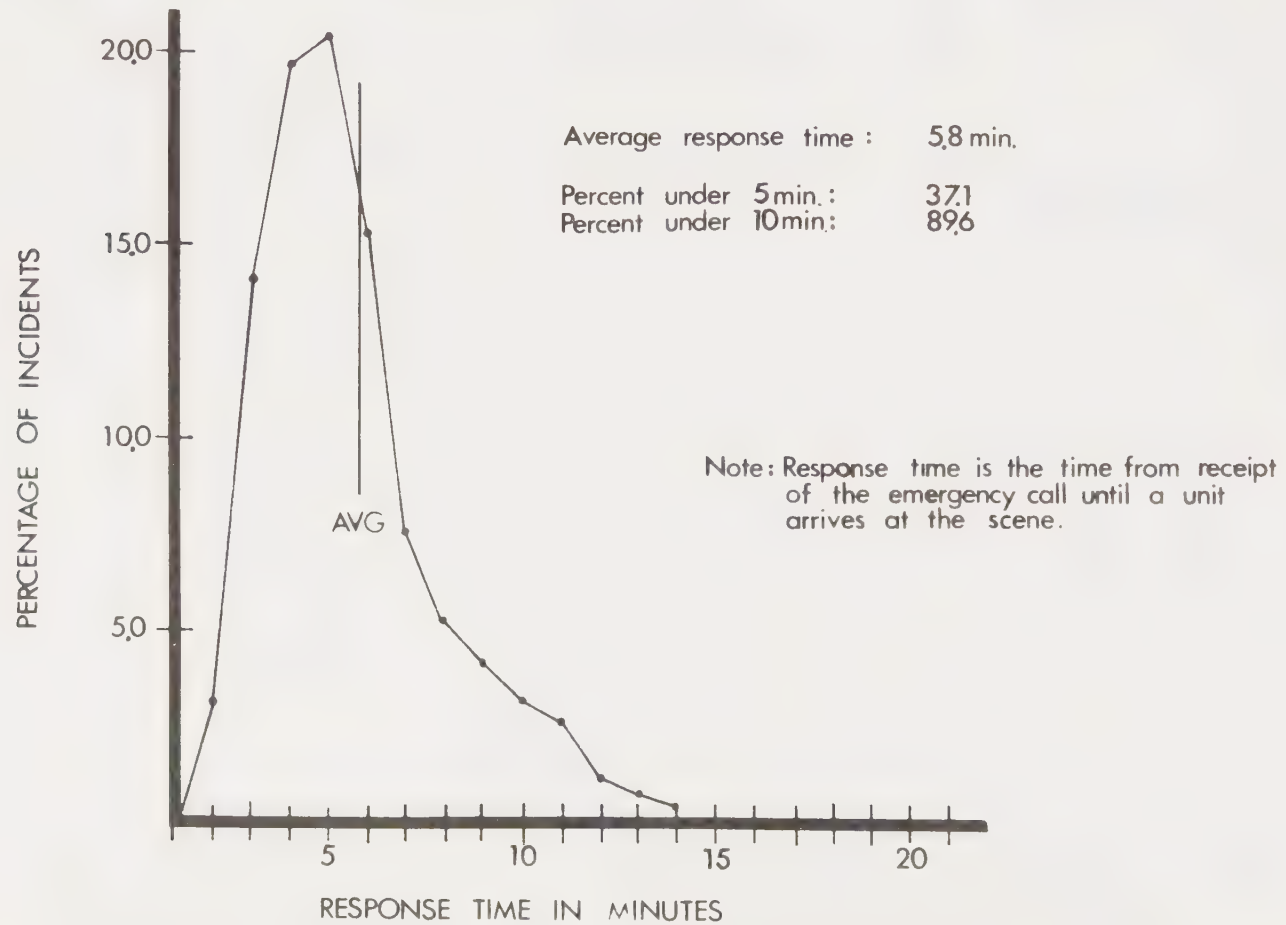
BATTALION NUMBER	NUMBER OF RUNS	PERCENT OF TOTAL	AVERAGE RESPONSE TIME	AVERAGE SERVICE TIME	AVERAGE TOTAL TIME PER RUN	% RESPONSE UNDER 5 MINUTES	% RESPONSE UNDER 10 MINUTES	NUMBER OF RA UNITS IN BATTALION
1	3,262	8.4	4.6	21.4	26.1	57.6	96.6	3
2	1,781	4.6	6.4	19.0	25.4	24.5	88.4	2
3	2,158	5.6	5.6	17.8	23.4	33.3	94.2	2
4	1,748	4.5	6.4	20.3	26.7	18.1	89.9	2
5	3,055	7.9	5.5	20.6	26.1	37.3	94.0	2
6	640	1.6	5.6	16.6	22.2	33.4	95.0	1
7	902	2.3	5.7	24.6	30.3	32.2	93.1	1
8	4,167	10.8	4.8	17.4	22.2	48.9	97.7	4
9	635	1.6	7.7	27.5	35.2	15.3	74.5	1
10	2,037	5.2	6.8	23.9	30.8	19.3	84.4	2
11	3,450	8.9	5.1	20.0	25.1	45.2	96.0	3
12	1,531	3.9	7.0	21.8	28.8	21.0	82.1	3
13	4,994	12.9	5.4	15.8	21.2	39.2	95.3	4
14	1,821	4.7	6.5	19.7	26.2	20.8	88.0	2
15	1,522	3.9	7.0	23.2	30.2	17.1	82.9	2
16	819	2.1	6.3	17.7	24.0	31.1	84.6	1
17	673	1.7	6.4	23.0	29.4	23.0	87.7	1
18	3,511	9.0	6.4	20.0	26.5	23.0	88.6	3
ALL OTHER UNITS	160	0.4	6.1	19.9	25.9	31.9	91.3	
WEIGHTED AVERAGE			<u>5.8</u>	<u>19.8</u>	<u>25.5</u>	<u>34.1</u>	<u>91.7</u>	

¹ SAMPLE DATA FROM ONE QUARTER ONLY

3.33

LOS ANGELES COUNTY FIRE DEPARTMENT EMERGENCY MEDICAL SERVICES - RESCUE OPERATIONS

SQUAD RESPONSE TIME DISTRIBUTION FOR ALL DISPATCH AREAS

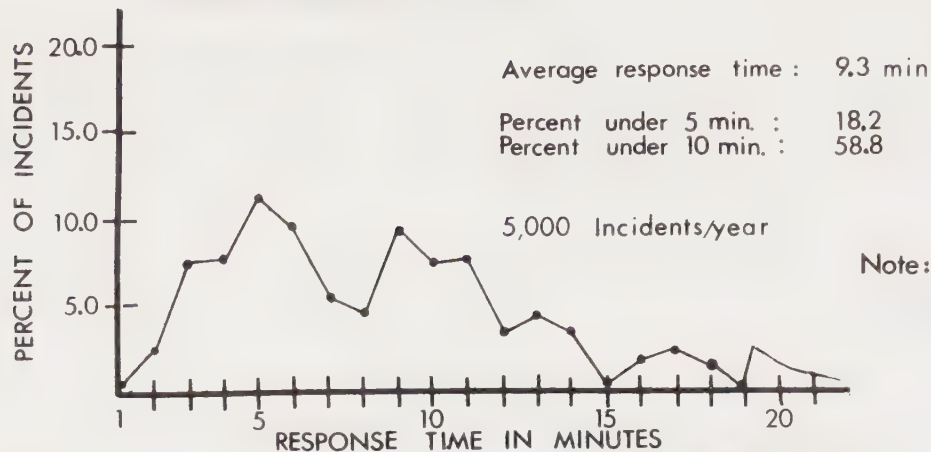


LOS ANGELES COUNTY FIRE DEPARTMENT

EMERGENCY MEDICAL SERVICES - RESCUE OPERATIONS

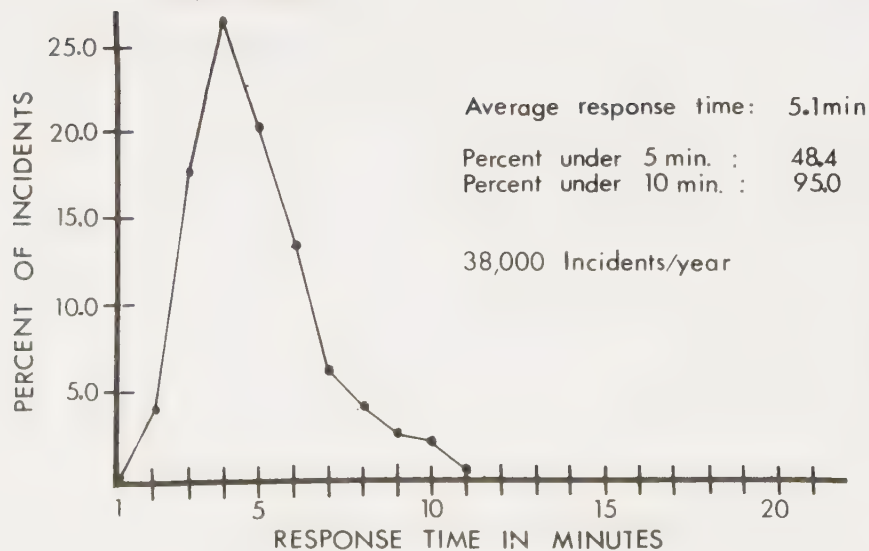
SQUAD RESPONSE TIME DISTRIBUTION BY DISPATCH AREA

ANTELOPE VALLEY

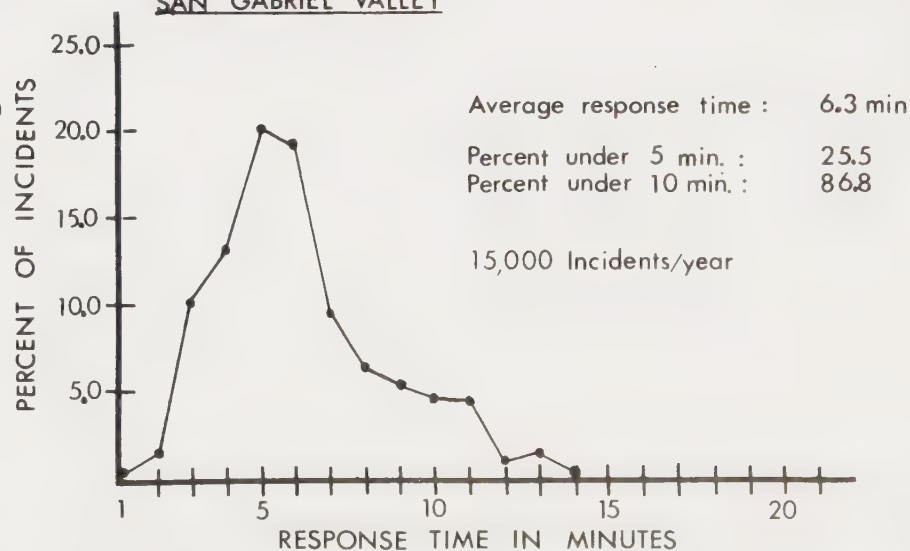


Note: Response time is the time from receipt of the emergency call until a unit arrives at the scene.

LOS ANGELES



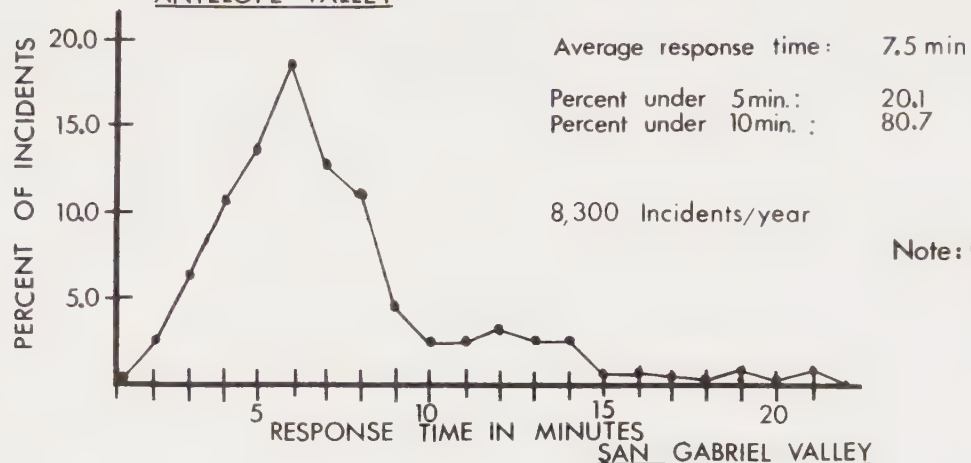
SAN GABRIEL VALLEY



LOS ANGELES COUNTY FIRE DEPARTMENT EMERGENCY MEDICAL SERVICES - RESCUE OPERATIONS

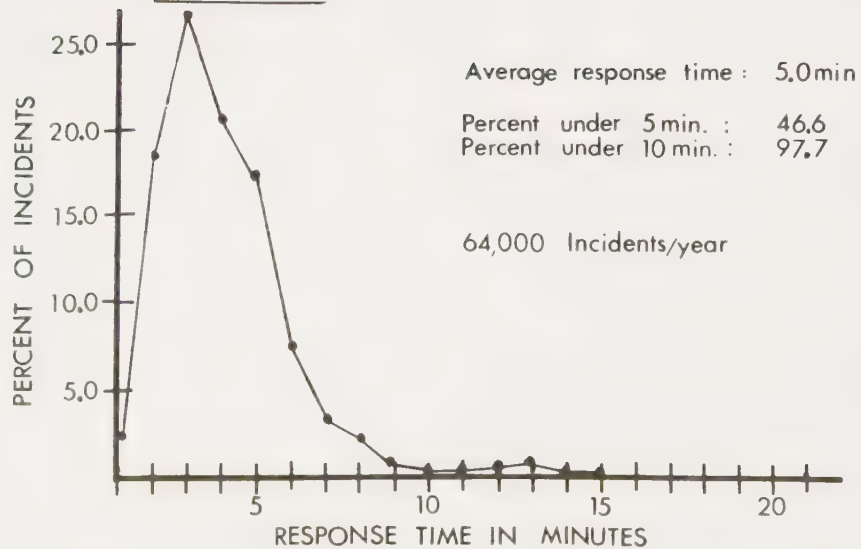
ENGINE RESPONSE TIME DISTRIBUTION BY DISPATCH AREA

ANTELOPE VALLEY

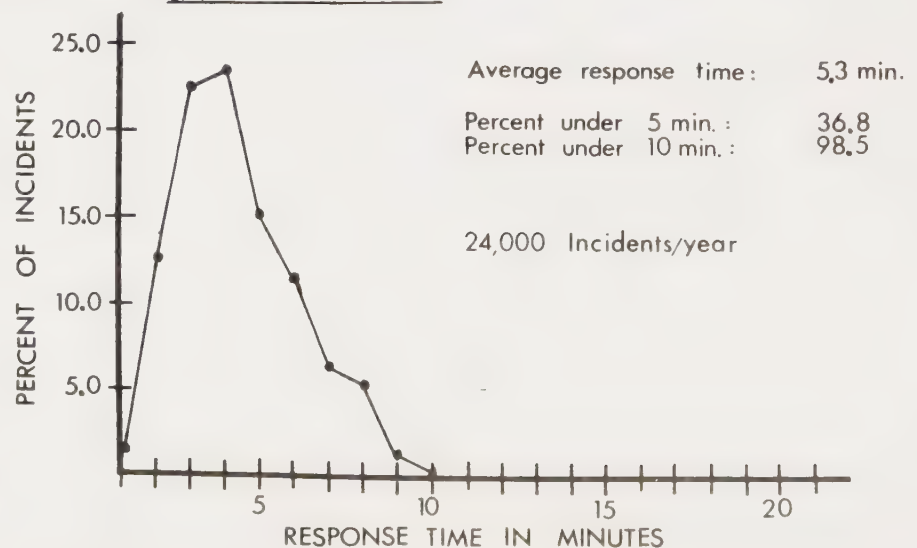


Note: Response time is the time from receipt of the emergency call until a unit arrives at the scene.

LOS ANGELES



SAN GABRIEL VALLEY



NOTE: NUMBER OF INCIDENTS INCLUDES BOTH
EMS AND FIRE RESPONSES

SECTION 4

PROJECTED EMS DEMAND AND RESOURCE REQUIREMENTS

1980 EMS DEMAND AND RESOURCE METHODOLOGY

Demand projections developed for the survey were derived from two sources:

- A predictive model developed in 1974 by the Los Angeles Countywide Coordinating Council on Emergency Medical Services¹. The Coordinating Council model was based upon 1973 EMS demand and selected demographic data, including;
 - . Resident population
 - . Employment level
 - . Married resident population
 - . Housing units
- Findings from a survey of mature EMS systems in metropolitan areas having demographic characteristics similar to the County.

Estimates of the number of emergency response vehicles needed to service 1980 demand were made based on:

- The two demand projections described above
- Two systemwide performance criteria:
 - . Average systemwide response time of five minutes
 - . 95% of all responses under ten minutes

The analysis indicated the general magnitude of the resource requirements and provided a basis for cost impact analysis.

¹Los Angeles Countywide Coordinating Council on EMS, Issues and Recommendations Regarding an EMS System for Los Angeles County (June 30, 1975), Vol. II, pg. 18.

CURRENT DEMAND

Based on data from each primary provider, the 1975 Los Angeles County EMS demand level was established at 285,000 responses. The distribution of demand by provider is shown in Table A.

TABLE A
DISTRIBUTION OF EMS RESPONSES

	<u>Volume</u>	<u>Percent of Total</u>
Los Angeles City Fire Department	134,184	47.0%
Los Angeles County Fire Department	57,733	20.3
Long Beach Fire Department	12,750	4.5
All Other City Fire Departments	55,275	19.4
Private Ambulance Company Responses As the Primary EMS Unit	<u>25,100</u>	<u>8.8</u>
TOTAL	285,042	100.0%

The 55,275 responses shown as "All Other City Fire Departments" represent the responses in independent cities other than Los Angeles and Long Beach which operate their own primary response units. Responses in cities such as El Monte, Glendale and Azusa, which contract with private ambulance companies, are shown under the heading "Private Ambulance Company Responses As the Primary EMS Unit".

The 285,000 emergency medical incident volume excludes approximately 60,000 private ambulance emergency runs. These runs were primarily either physician referrals to a specific ambulance company arranging the transfer of a patient from the patient's home to the hospital, or patient calls requesting emergency transport. Although these runs may be emergency responses, they were excluded because they do not represent requests for emergency service from primary EMS providers.

COORDINATING COUNCIL 1980 DEMAND PROJECTION

The Coordinating Council model was developed and validated

using 1973 EMS data. Once validated, the model was used to project 1980 and 1985 demand estimates. These estimates were adjusted to account for the effects of the introduction of paramedic response units during the period from 1973 to 1976.

Using future population estimates, the model projected 1980 and 1985 EMS demand by area. To account for the implementation of paramedic units and corresponding volume increases, the growth rate predicted by the model was adjusted upward by 10% per year from 1974 to 1976. The results are summarized in Table B.

TABLE B

SUMMARY OF COORDINATING COUNCIL MODEL RESULTS

	1980 <u>Without Adjustment</u>	1980 <u>With Adjustment</u>
Population	7,344,479	7,344,479
EMS Demand	277,000	381,080

Expressing the data as an EMS incident rate, the Coordinating Council's projection results in 51.9 incidents per 1,000 population per year in 1980.

TOUCHE ROSS PROJECTED EMS DEMAND

Very little definitive information is available regarding demand projection techniques for EMS. Nationally, an average estimate used for planning purposes is one EMS incident every twenty-four hours per 10,000 population. This estimate converts to 36.5 EMS incidents per 1,000 population per year. Using the survey of 1975 demand (285,000 incidents in 1975) and a recent estimate of 1975 population of 7,020,772¹, the average incident rate in the County now is 40.6 incidents per 1,000 population per year. This rate exceeds the national planning estimate by over 10% and can be expected to increase.

¹Southern California Association of Governments, Forecast Memo (December, 1975).

To develop a more useful projection of 1980 EMS demand, an analysis was made of the pattern of current demand by area in the County. When converted to rates per 1,000 population per year, the demand for emergency medical services varies widely between geographic areas. The selected data shown in Table C illustrates these variations.

TABLE C
EMS INCIDENTS/1,000 PEOPLE/YEAR (1975)

Downtown Los Angeles	265.0
Commerce	127.0
Beverly Hills	42.4
Lancaster Area	29.1
San Marino	26.5
Arcadia	23.5
Sierra Madre	16.8

The variation in 1975 demand across the entire County is shown in Exhibit 4-A on page 4.12. The exhibit shows a concentrated demand area in downtown Los Angeles and southward into Vernon. High demand concentrations are also shown for the City of Industry, Irwindale, and Altadena. The rates shown in these areas are large because the resident population is relatively small. If workforce and other factors were considered in computing the rate, it would more closely approximate that of the surrounding localities. As shown by a comparison of Exhibit 4-A and Exhibit 4-B on pages 4.12 and 4.13, there is generally a high correlation between the rate of demand for emergency ambulance services and population density in the County.

Many of the variations in demand intensity can be explained by demographic or economic factors or by the fact that EMS systems in some areas have not reached their long-term maximum

volume limits. Historically, EMS providers have experienced large increases in demand after paramedics were introduced. These increases can result in growth rates of 10% to 20% per year for several years. To obtain an idea of how much volume can be anticipated in an EMS system which has grown past the initial fast growth phase, a demand survey of several major metropolitan EMS programs was conducted. The results of the survey are shown as demand per 1,000 per year and are displayed in Exhibit 4-C on page 4.14. The rates vary significantly by metropolitan area, as do the rates computed for various areas in Los Angeles County.

An examination of the demand rates shown in Exhibit 4-C indicates that even for cities such as Jacksonville, Florida or Dallas, Texas, which are not typical high-density urban environments, rates of near fifty are already being experienced and probably will exceed this level by 1980. For cities such as Baltimore and Detroit, which have high-density urban characteristics, rates near eighty are prevalent and will increase by 1980.

Areas of the County can be identified which have demographic and geographic characteristics which are similar to these and other metropolitan areas. However, many areas of the County are not as yet completely serviced by EMS systems which have had paramedics for several years. As paramedics are acquired and as these systems mature their EMS utilization rates will increase. From the analysis, it would appear that rates of fifty to fifty-five incidents per 1,000 population per year are reasonable upper limits for suburban and moderately urban areas in the County by 1980. For heavily urbanized areas, a rate of eighty-five appears reasonable when compared to current local and national rates for high-density urban areas.

These estimates result in a demand projection of 450,000 EMS incidents in Los Angeles County by 1980. A detailed analysis of projected rates of demand by area is contained in Appendix A. Based on an estimated 1980 population of 7,196,000¹ which is more recent than that used by the Coordinating Council and on the projected 450,000 incidents, the countywide average rate in 1980 would be 62.5 incidents per 1,000 per year. The overall compounded annual growth rate that results from this projected change in demand (40.6 to 62.5 in five years) is 9.01% per year. This growth rate appears to be a reasonable

¹Southern California Association of Governments, Forecast Memo (December, 1975).

estimate. Many areas in the County are currently experiencing higher rates of growth, but the rate of growth can be expected to decline as their systems mature.

Exhibit 4-D on page 4.15 presents the demand projection graphically. The graph is not intended to depict the exact "market share" of each provider group. It was developed to compare 1975 demand with the 1980 projection and to approximate the 1980 volumes of the major providers involved.

The difference between 1975 demand and the Coordinating Council's 1980 projection reflects a compounded annual growth rate of only 5.9% per year, which is significantly below probable future growth rates. For this reason, the Coordinating Council's 1980 projection of 381,000 incidents or an average of 51.9 incidents per 1,000 people is probably too low for Los Angeles County.

FACTORS AFFECTING RESOURCE ALLOCATION

In an emergency medical system, response time is the pivotal criterion which determines the number of resource units required to operate the system. In fact, performance criteria have more influence on resource requirements than does the level of demand being serviced.

The 1975 California State Plan for Emergency Medical Services¹ sets forth objectives and standards for response time and service area configuration for emergency medical systems. The plan does not explicitly define response time, but implies that response time is point to point travel time. In the State Plan, maximum response times are stated for three relative levels of population density, which correspond to U.S. Census Bureau definitions of high, medium and low population densities. The maximum acceptable response times are shown in Table D. If these criteria were converted to the definitions which are used in this report, the response time limits must be increased by approximately forty-five seconds to account for dispatch delays. The State Plan also establishes maximum response times, from the response location to the scene, of no more than thirty minutes for 95% of all calls.

¹California Department of Health, Vol. I, pp. 128-148.

TABLE D
STATE PLAN RESPONSE TIME CRITERIA

<u>Population Density</u>	<u>Maximum Response Time for 95% of Calls</u>
High	10 minutes or less
Medium	20 minutes or less
Low	30 minutes or less

There are several major factors which influence response time and thereby influence the allocation of resources in an EMS system:

- Area size
- Geographical distribution of demand
- Vehicle station locations
- Average vehicle travel speed
- Street configuration and travel barriers
- Time frequency of demand
- Number of response units available
- Service time
- Internal dispatch procedures
- Number of response units

The size and configuration of the service area and the geographical distribution of demand determine the average travel distance to an emergency. The geographical distribution of demand is not dependent on population density alone. Per capita demand may be higher in one area than in another with equal population density.

Since demand for emergency medical services is typically not distributed in a homogeneous manner throughout a service area, an emergency unit should be located near the areas of heavier demand. Street configuration and travel barriers in a service area can affect response time and should also be considered in

determining a vehicle's primary response location. At higher vehicle utilization levels, the primary response location tends to become less significant because a unit will more often be responding from a hospital or the scene of a previous emergency, rather than from its quarters.

Time frequency of demand is the number of EMS calls which occur in a given period of time. In a high demand area, there is a greater likelihood that the unit servicing that area will be busy when a call for emergency service occurs. If the primary emergency unit is busy, the call will have to wait or be serviced by a unit from a neighboring service area. In either case, the total response time to the emergency incident will be greater than if the primary unit had been immediately available. In an average day, the demand for emergency service may be as much as seven times greater for peak hours than for the lowest demand hours. The highest demand for emergency medical services typically occurs from 4:00 p.m. to midnight and the lowest demand typically occurs from 2:00 a.m. to 9:00 a.m.

Usually in urban regions where service areas are geographically small, fewer units are required to maintain a minimum response time at low demand hours than are required at peak hours. For example, a response system could be designed providing service with a constant number of vehicles across a twenty-four hour day. The system might, as a daily average, respond to 95% of the incidents within a ten minute maximum response time limit. If, however, the peak hour of the day were examined, it may be discovered that only 65% of the emergency medical incidents are serviced within the ten minute maximum response time guidelines. If a constant response criterion were required throughout the day, it might be economical to have varying numbers of units available, corresponding to the changes in demand for emergency medical services.

Service time directly affects response time because it determines, to some extent, the likelihood of the unit being busy when an emergency occurs. Minimizing service time will decrease the time an emergency incident might wait for a unit to become available. Minimizing service time will also reduce the number of times a unit from a neighboring area will be required to respond.

During the dispatch process time, the address of the incident is recorded and verified, and an appropriate unit is selected for dispatch. The organization of the dispatch process, the number of people involved and the types of support equipment utilized all influence the amount of time required to dispatch a unit.

The dispatcher in a highly utilized response system is often

faced with decisions that affect the overall performance of the system. A busy dispatcher has many decisions about whether or not to dispatch a neighboring unit or to wait for a busy unit to become available for dispatch. The dispatcher's knowledge of the dispatch area, his ability to select appropriate units, and his ability to keep the status of emergency units current all affect the response time of the system.

The response time does not vary linearly with the number of units in a system. For example, in a particular situation it might take a 25% increase in the number of units to achieve a 6% decrease in response time or to change the percentage of responses taking "ten minutes or less" from 95% to 99%.

1980 RESOURCE REQUIREMENTS

The resource allocation methodology described in detail in Appendix B, was used to analyze estimated vehicle requirements in 1980. The analysis is not intended to be precise in its projections; there are many variables which may affect the results between now and 1980. However, the analysis indicates the general magnitude of the resource requirements and provides a base from which to estimate the cost impact of system alternatives.

For analytical purposes, two hypothetical 1980 system designs were simulated mathematically:

- A countywide system with a uniform vehicle response regardless of political boundaries, but taking natural geographical constraints into account
- A continuation of the current operational configuration carried forward to 1980 demand levels

Uniform, Countywide System

The analysis described in Appendix B indicates that a demand of 450,000 EMS incidents per year can be serviced by an estimated 160 units on the average and achieve the currently accepted but informal system performance standard of a five minute countywide average response time. Furthermore, over 99% of all runs would have a response time of ten minutes or less. Exhibit 4-E on page 4.16 shows the expected performance variations for a countywide system and illustrates the five minute average response workload. The number of vehicles needed to

maintain the five minute response would vary with hourly demand from a low of 133 units to a peak demand requirement of 176 units as compared to the 132 units currently in service.

The graphs presented in Exhibit 4-F on page 4.17 show the changes in average response time and the behavior of the response time curve as the number of units changes. The average response time curve on the left of the exhibit indicates that if a 100 unit system were selected, the average response time would be approximately 6.6 minutes (defined by the intersection of the "Daily Average" demand curve with a line drawn through the 100 unit point). However, as demand changes during the day, response times would vary between approximately 5.9 minutes during low demand periods and 7.5 minutes during high demand periods. Overall vehicle utilization for a 100 unit system with 450,000 runs would be approximately 27% (assuming a service time of twenty-five minutes). During high demand hours, this utilization would climb to 44% and during low demand hours would drop to 6%.

The performance criteria selected have a significant impact on the amount of resources required. Exhibit 4-G on page 4.18 shows the impact of the number of response units on response times and vehicle utilization. If the state standards were utilized as the performance criteria only 115 units on the average would be required to service 1980 demand. This would result in seventeen fewer vehicles on the average than are currently utilized to service 1975 demand. The average response time for a 115 unit system would be approximately six minutes and vehicle utilization would average 23%.

In Appendix B, vehicle requirements were developed using both this survey's estimate of 450,000 EMS incidents in 1980 and the Coordinating Council's estimate of 380,000. Table E compares the two sets of results.

TABLE E
ESTIMATED VEHICLE REQUIREMENTS

<u>Performance Criteria</u>	<u>Demand Level</u>	<u>Vehicle Estimates</u>	
		<u>Touche Ross (450,000)</u>	<u>Coordinating Council (380,000)</u>
Five Minute Average Response	High	176	167
	Average	159	152
	Low	133	131
95% Responses Under Ten Minutes	High	132	126
	Average	115	110
	Low	91	90

The 16% difference in total demand between 450,000 and 380,000 incidents only causes a reduction of 2% to 5% in the number of units required. This result indicates that potentially large errors in the demand forecast do not necessarily cause significant errors in resource requirement estimates.

The Coordinating Council estimated that 130 units would be able to provide a five minute average response with a total demand of 380,000 incidents per year. The resource estimates shown in Table E are different because of differences in the definitions of response time. The Coordinating Council did not include the time required for dispatching a response unit in their definition of response time. If the average dispatch delay time were added to the average response time used by the Coordinating Council to make the definitions comparable, the result would agree closely with the resource allocation data developed for this survey.

Continuation of the Current System

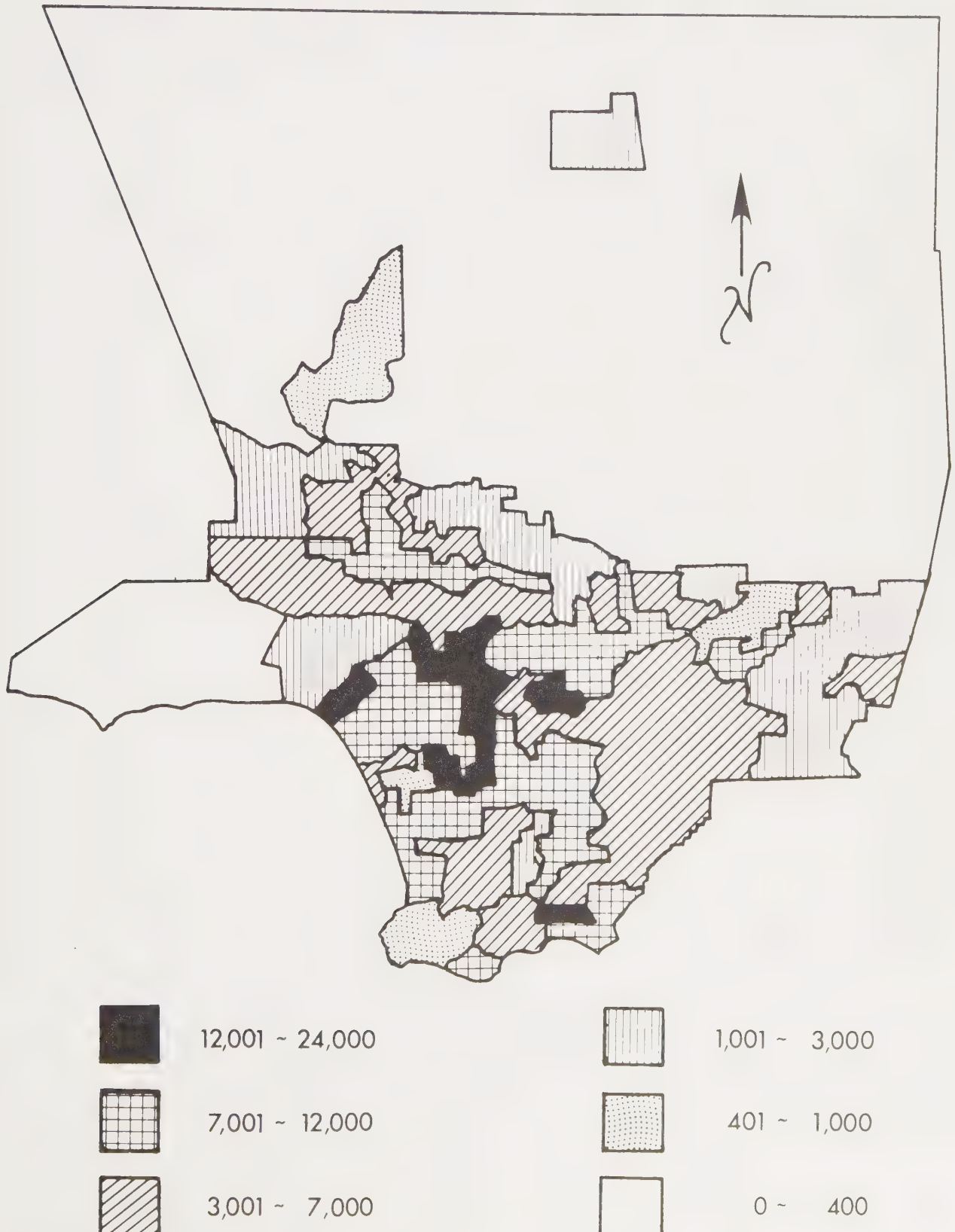
To establish a reference point for examining cost relationships, an estimate was developed of the number of vehicles potentially in use by 1980, if the existing system were carried forward with no changes other than those required to service increased demand. Currently, there are 132 primary EMS response units in operation in the County. This number includes both public providers and private providers under contract to cities such as Glendale, Azusa, and Monterey Park. Utilizing the methodology described in Appendix B, a five minute average response time, and the volume estimate of 450,000 incidents in 1980, approximately 194 response units would be required. This number represents an increase of 50% over the number of units currently in service.

LOS ANGELES COUNTY — 1975 EMS DEMAND



LOS ANGELES COUNTY POPULATION DENSITY

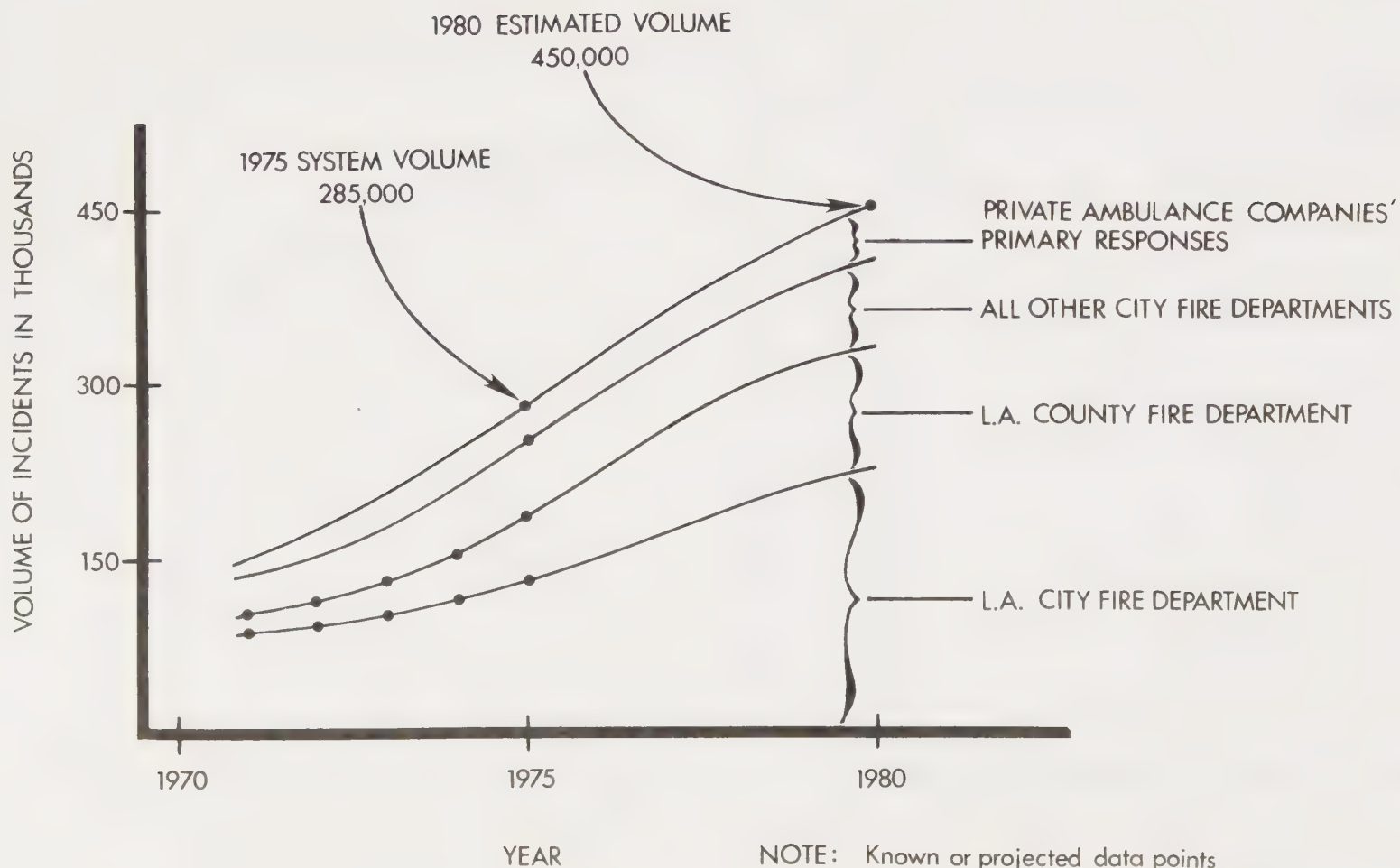
POP. / SQ. MILE



EMERGENCY MEDICAL INCIDENT RATE IN SELECTED U.S. CITIES

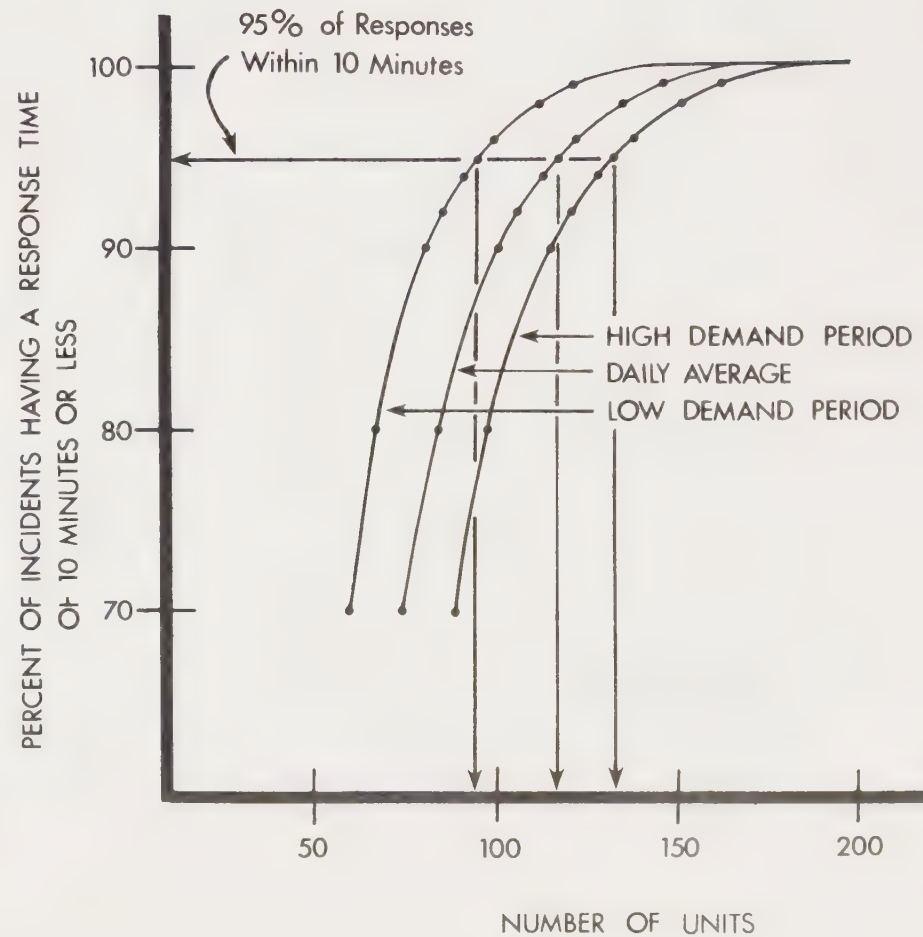
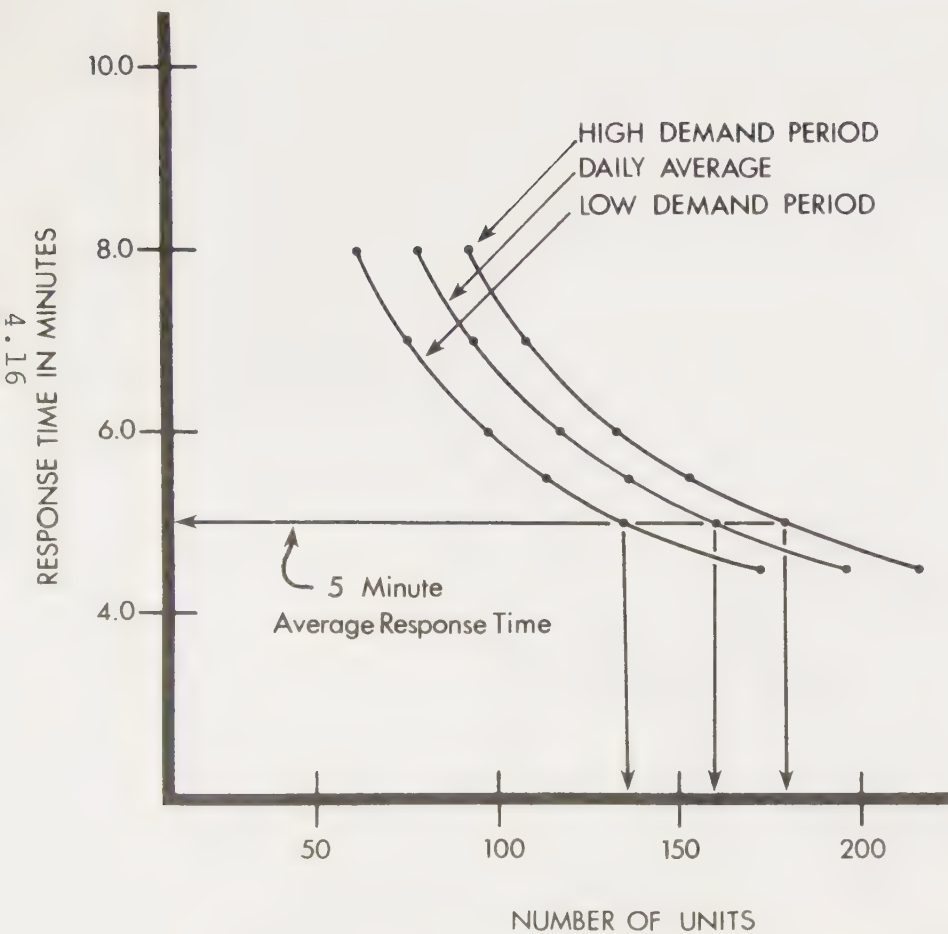
	INCIDENTS PER 1000 PER YEAR 1974	INCIDENTS PER 1000 PER YEAR 1975	PARAMEDIC UNITS IN OPERATION
BALTIMORE, MARYLAND	74.2	79.6	YES
CHICAGO, ILLINOIS	48.3	52.1	No
COLUMBUS, OHIO	69.3	73.6	YES
DALLAS, TEXAS	-	47.9	YES
DENVER, COLORADO	48.0	51.5	YES
DETROIT, MICHIGAN	80.4	81.0	No
FAIRFAX COUNTY, VIRGINIA	36.8	39.3	No
GLENDALE, CALIFORNIA	-	35.8	YES
HOUSTON, TEXAS	32.6	35.5	YES
JACKSONVILLE, FLORIDA	46.0	48.0	YES
LONG BEACH, CALIFORNIA	-	35.3	YES
LOS ANGELES CITY FIRE DEPARTMENT	43.9	48.6	YES
LOS ANGELES COUNTY FIRE DEPARTMENT	21.0	28.2	YES
MIAMI, FLORIDA	-	72.0	YES
NEW YORK, NEW YORK	63.8	67.7	No
PASADENA, CALIFORNIA	-	44.1	YES
PITTSBURGH, PENNSYLVANIA	-	70.0	YES
SAN ANTONIO, TEXAS	35.6	38.1	YES
SAN DIEGO, CALIFORNIA	23.5	29.0	YES
SAN FRANCISCO, CALIFORNIA	67.0	74.7	YES
SPRINGFIELD, MASSACHUSETTS	-	37.3	No
TORRANCE, CALIFORNIA	-	24.4	YES
WASHINGTON, D. C. - METRO AREA	57.3	-	-

EMS INCIDENT VOLUME



1980 SYSTEM PERFORMANCE CHARACTERISTICS**450,000 INCIDENTS/YEAR**

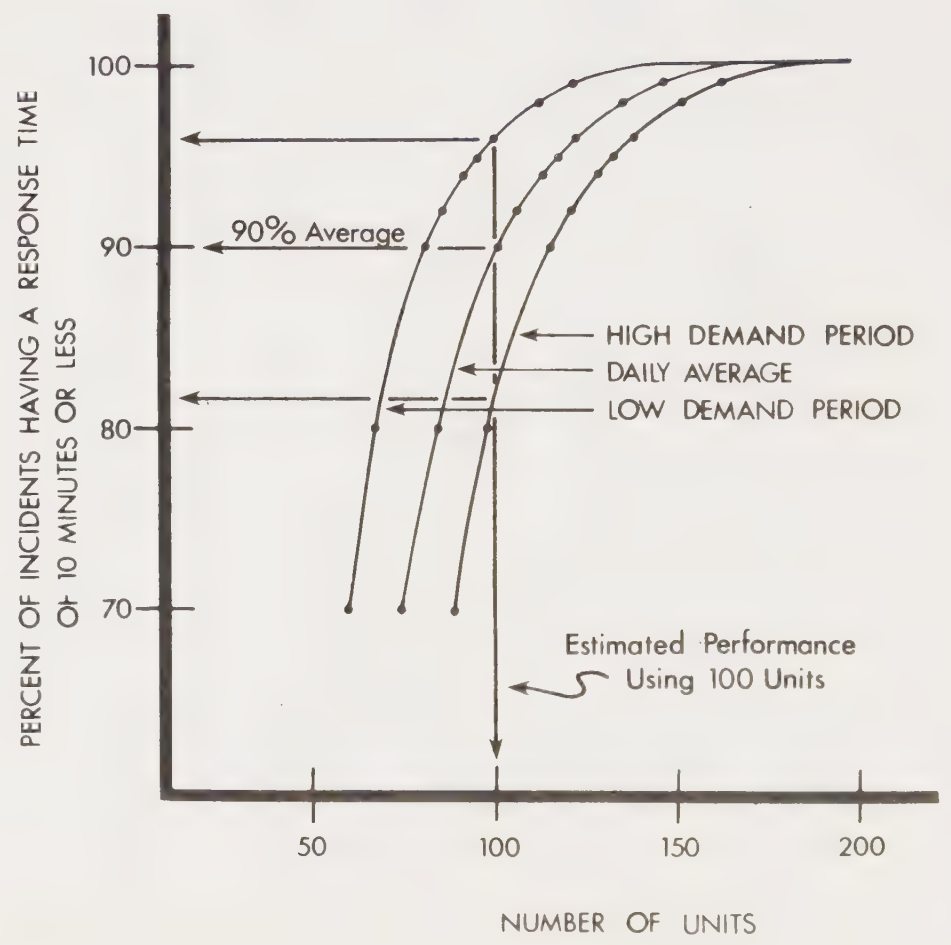
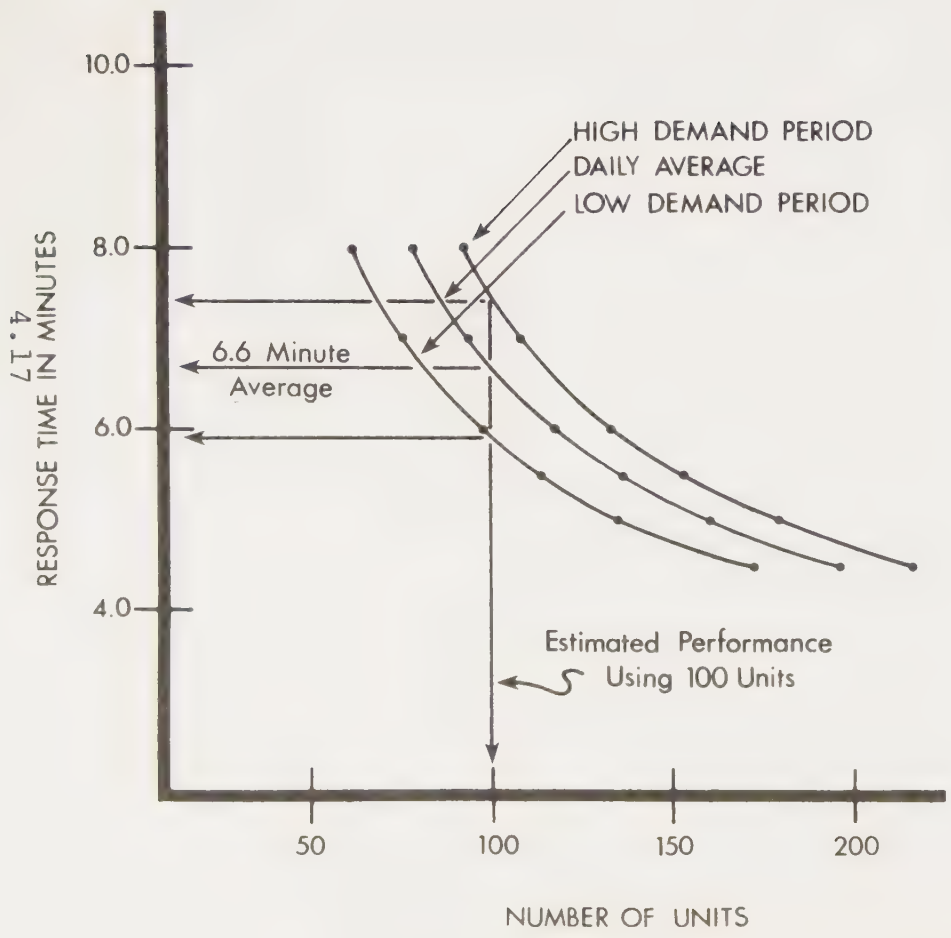
(FIVE MINUTE AVERAGE RESPONSE TIME)



1980 SYSTEM PERFORMANCE CHARACTERISTICS

450,000 INCIDENTS/YEAR

(AVERAGE RESPONSE TIMES USING 100 UNITS)



DETAILED SYSTEM PERFORMANCE DATA

NUMBER OF UNITS	APPROXIMATE AVERAGE RESPONSE TIME			PERCENT VEHICLE UTILIZATION			APPROXIMATE PERCENT OF RESPONSES WITHIN TEN MINUTES		
	HIGH	DAILY	LOW	HIGH	DAILY	LOW	HIGH	DAILY	LOW
	<u>DEMAND</u>	<u>AVERAGE</u>	<u>DEMAND</u>	<u>DEMAND</u>	<u>AVERAGE</u>	<u>DEMAND</u>	<u>DEMAND</u>	<u>AVERAGE</u>	<u>DEMAND</u>
80	9.6	8.0	6.7	57	35	8	56	76	89
100	7.4	6.6	5.8	44	27	6	82	90	96
120	6.4	5.9	5.3	36	22	5	92	96	98
140	5.8	5.4	4.9	30	19	4	96	98	100
160	5.3	5.0	4.6	26	16	4	99	100	100
180	4.9	4.7	4.4	23	14	3	100	100	100
200	4.6	4.5	4.3	22	13	3	100	100	100

THESE FIGURES ASSUME 450,000 INCIDENTS PER YEAR

SECTION 5

SYSTEM COSTS AND COST-EFFECTIVENESS

COST METHODOLOGY

A requirement of this survey was to develop an estimate of the current cost to the County of EMS field operations. In addition to estimating the EMS costs incurred by the County, costs have been estimated for each of the EMS delivery systems in the County and for EMS field operations countywide.

No single cost measure provided enough information to satisfy the survey requirements and adequately answer each of the questions likely to be raised about EMS system costs. For example:

- If an independent agency were to assume all of the EMS operations, what would the potential savings be to the existing EMS providers?
- What are the costs of support services directly associated with EMS field operations?
- What would be the approximate cost of a new agency established to operate the existing EMS system?

To answer each of these questions required a different level of costing. The cost methodology developed for this survey utilized a three-tiered approach; the total cost of field operations have been separated into three levels:

- Direct Cost: this level includes salaries and benefit costs for full time EMS personnel, operating expense, maintenance, and depreciation of vehicles and equipment used only for EMS activities and operating expenses for vehicles used only in part for EMS. Essentially, these costs are incremental costs which are roughly proportionate to the number of vehicles used. If the EMS operations were discontinued, all direct costs could be eliminated.
- Allocated Support Cost: this level includes the Direct Costs plus the costs of personnel, vehicles, supplies, and other items which are shared between EMS and other programs such as fire services. An example of shared costs

would be the salaries and benefit costs for fire personnel who respond along with a rescue ambulance. The appropriate share of operating expense, maintenance, and depreciation for fire engines would also be part of the Allocated Support Costs.

- Modified Fully Absorbed Cost: this level includes the Direct and Allocated Costs and adds an appropriate share of departmental and local jurisdictional overhead. Not all jurisdictional overhead costs have been included. Only semi-variable costs normally allowed as program overhead when reporting costs for Federal grant management purposes were utilized. The overhead computation was made using rates developed by the localities for Federal grant reporting according to OMB Federal Management Circular 74-4.

Each level includes only those costs that were either directly or indirectly related to EMS field operations. Costs which have been included are:

- Personnel costs - all or part of the cost for salaries and benefits, for all people associated with the direct delivery of services, including:
 - . Paramedics
 - . EMT I's
 - . Firefighters and fire supervisory personnel
 - . Dispatchers
- Vehicle costs - all or part of the operating costs, maintenance costs and depreciation expense for vehicles used, including:
 - . Rescue ambulances
 - . Squad vehicles
 - . Other vehicles, such as vans and carryalls
 - . Fire apparatus (triple combination pumpers)
- General and Administrative costs, including:
 - . Maintenance and depreciation for:

- .. Telemetry equipment
- .. Radio equipment
- .. Miscellaneous medical equipment
- .. Telephone equipment
- .. Facilities
- . Office and clerical staff cost
- . Training cost presently incurred by the primary providers for certification or recertification of paramedics
- Overhead cost for fire department and local jurisdictional services
- Hospital personnel and equipment cost when telemetry or medical supervision is required during paramedic runs
- Cost of transportation by private ambulance companies paid by individuals transported, or by the County through EAP for dry runs and uncollectible patient bills

Several peripheral cost components were excluded from the estimates of the costs of EMS field operations in the County. These costs were excluded because they are not appropriately allocable to primary EMS providers, because they are dealt with separately in other sections of this report, or because their inclusion would not add additional insight to the evaluation of the cost-effectiveness of alternative delivery systems. The peripheral costs that were excluded are:

- Cost of resources which are external to the basic EMS system, such as law enforcement, lifeguard, and Coast Guard operations
- Cost of the helicopter operations in the County Fire Department and the County Sheriff
- Cost of the Sheriff's Emergency Services Detail
- Cost associated with the County Department of Health Services Emergency Medical Systems Division
- Cost of the management and clerical operation of the Emergency Aid Program

To facilitate the comparison of the effectiveness of alternative delivery systems minor cost variations between providers were eliminated through the use of standardized costs which were developed and applied systemwide. These included:

- Depreciation of rescue ambulance vehicles
- Depreciation of fire engine apparatus
- Depreciation of paramedic telemetry equipment
- Depreciation of radio equipment
- Per gallon prices for gasoline and diesel fuel
- Square footage cost for vehicle storage space
- Hospital personnel and equipment costs involved in telemetry processing
- Charges for private ambulance transports, which include charges to individuals and third party payors, and EAP payments for uncollectibles and dry runs

A more detailed discussion of the cost methodology is provided in Appendix C and the associated subappendices.

CURRENT SYSTEM FIELD TRANSPORT COST

Exhibit 5-A on page 5.14 presents the combined costs for all field operations countywide. The total system Direct and Modified Fully Absorbed Costs before revenues are deducted were \$17,800,000 and \$38,100,000, respectively. The Net Direct Cost of the system was approximately \$14,000,000 and the Net Modified Fully Absorbed Cost was \$34,000,000. The total revenue collected by both public providers and by private ambulance companies from individuals and third party payors was approximately \$3,800,000.

Exhibit 5-B on page 5.15 presents the individual system cost elements and revenues as percentages of the total system cost. The majority (65.6%) of the Direct Cost consisted of salaries paid to EMS technicians operating in public agencies. Salary costs for personnel in private ambulance companies are included as part of the charges to patients (18.6%) which are shown as a separate line item.

The costs of countywide field operations have been separated into total tax base costs and total system costs. The tax base costs are those costs which are borne by the tax bases of the County and local jurisdictions. The total system costs include the tax base costs but also include hospital support costs and charges paid for transportation by users of the system. Two approaches to the presentation of the cost data were needed because systems differ in the proportion of the costs that is borne by users of the system and the proportion that is funded by the tax base.

Exhibit 5-C on page 5.16 displays the countywide tax base costs and total system costs at each of the three cost levels. The total tax base Allocated Cost (before deducting revenues) of \$26,674,000 is lower than the corresponding total system Allocated Cost of \$30,106,000, because it excludes the hospital support cost and the cost of approximately 45,000 private ambulance transports. These transports represented a cost to the users of the system of approximately \$2,200,000. Not all of this amount is actually paid by individuals; a portion is paid by third party payors such as Blue Cross, Medicare, and Medi-Cal.

It can be concluded from the data in Exhibit 5-C that the EMS system as it is currently configured is predominantly tax supported. The more than 285,000 responses serviced by the system in 1975 cost the taxpayers of Los Angeles County approximately \$87.99 each in Allocated Cost after revenues were deducted. On a per capita basis the annual Direct Cost to the taxpayers net of revenues was approximately \$2.01; the net Allocated Cost per capita was \$3.58; and the net Modified Fully Absorbed Cost per capita was \$4.73.

COST ANALYSIS BY TYPE OF SYSTEM

Exhibit 5-D on page 5.17 presents net cost estimates of current operations for fourteen of the delivery systems. These costs have been developed using the same methodology as the 1975 total cost. The delivery systems are the same as those discussed in Section 3.

Comparison of Systems 4 and 6

The two major delivery systems in Los Angeles County, System 4 (Los Angeles City Fire-Type) and System 6 (Los Angeles County Fire-Type) are large enough to warrant a discussion of their specific cost structures. The total current costs before revenue deductions of System 4 and System 6 are shown in Table A.

TABLE A
COST COMPARISON OF SYSTEMS 4 AND 6
\$000's Omitted

	<u>System 4</u> <u>City of</u> <u>Los Angeles-Type</u>	<u>System 6</u> <u>County of</u> <u>Los Angeles-Type</u>
Direct Cost	\$ 8,123	\$1,419
Allocated Cost	\$11,525	\$5,450
Modified Fully Absorbed Cost	\$14,639	\$7,703

Exhibit 5-E on page 5.18 provides a summary of the cost components expressed as a percent of total cost before revenues are deducted. System 4 with its full-time EMS personnel has the majority (85%) of its Direct Cost in personnel expense, while System 6 which uses dual-role firefighters has its Direct Cost concentrated in the charges made by private ambulance companies. This illustrates the two basic operational differences between systems similar to the City and County Fire Departments: one uses full-time personnel with transport vehicles; the other uses dual-role fire personnel with private ambulance transport.

The City Fire Department System (System 4) has high Direct Costs which are funded primarily from tax base revenue, and uses full-time ambulance personnel with transport vehicles. Charges are made for services, and collections are about 54% of total potential revenue. The County Fire Department system (System 6) has a much lower Direct Cost salary component but large private ambulance costs. Thus, as an out-of-pocket cost to the tax base, a System 6-type operation is much less expensive than one similar to System 4. The majority of the Direct Cost in System 6 is paid by the patient receiving the service.

A review of Allocated and Modified Fully Absorbed Costs indicates that the two systems are similar in the amounts of vehicle cost and general administrative cost, but that System 6 has a higher percentage of overhead. Because overhead is related to personnel time and expense, the use of engine companies on all EMS runs causes the System 6 overhead component to be proportionately larger.

Systems Using Private Ambulance Companies as Primary Providers

Systems 9 and 10 use private ambulance providers, some under contract to the local jurisdiction, others through the

Emergency Aid Program, to act as the primary EMS response units. Depending upon the specific situation, various contract arrangements have been instituted. One city has set a specific limit on the total amount it will pay for emergency service. The ambulance company receives a flat fee per year to cover expenses for runs for which the company is not separately reimbursed. Another city pays a subsidy and then additionally pays through EAP for uncollectible runs or dry runs.

Direct Cost to the tax base under each of these arrangements is low enough to make them financially attractive to the communities they serve. The overall Allocated and Modified Fully Absorbed Costs without revenue deductions are comparable to other system which have similar sized operations.

Cost Comparisons Between Current Systems

As shown in Exhibit 5-F on page 5.19, the cost per run and cost per unit differ from one system to another. The exhibit presents the cost data net of revenues for each system type and shows costs for each of the three cost levels. For comparing costs between systems, Direct Cost and Allocated Cost give the most accurate representation of cost levels. However, using Direct Cost does not produce a true comparison between the total value of services rendered because it omits the costs of shared resources and personnel.

The largest Allocated Cost per unit occurs in those systems (1 or 2) with full-time EMS personnel and engine companies which always respond. Systems 13 and 14 with very small or volunteer operations have the lowest cost per unit (under \$15,000). System 4, which includes EMS operations similar to the City of Los Angeles Fire Department, has a per unit cost which is higher than that of System 6 (County Fire Department-type systems), even though System 6 always has a three to four man engine company which accompanies the squad. The cost per unit is higher because System 4 uses full-time EMS personnel rather than dual-role firefighters as in System 6.

Cost Per Run - Variation with Volume

Cost per run illustrates general differences in the cost-performance relationships between systems. However, little definitive information can be developed from unadjusted cost per run data. EMS systems operate at different workloads and may have different costs per run even with similar costs. A useful analytical technique is to examine each system's cost

per run at maximum volume. The removal of the operational "slack" will normalize the cost per run for each delivery system. An example is shown in Exhibit 5-G on page 5.20 in which three systems, X, Y, and Z, all have the same initial volumes and costs per run. The exhibit illustrates the effect of a 50% increase in volume from 1,000 to 1,500 runs per year. If costs were not a function of volume at all, the cost per run would be \$4.00 for all systems, a 33% decrease. As shown, the costs do decrease, but in varying amounts, depending upon the relative proportions of direct and shared costs. Direct Cost per run will go down as the number of runs increases, but Allocated or Shared Costs generally vary with run volume and, therefore, will increase as volume increases.

If the same technique were to be applied to the current EMS systems, a maximum volume assumption must first be defined for each type of unit. Because there are three basic units, three assumptions are necessary: 1) that engine companies average no more than 1,500 runs per year; 2) that squad units with dual-role personnel average about 2,500 runs per year; and 3) that rescue ambulances units with full-time personnel average not more than 3,600 runs per year. These assumptions, predicated on a typical mix of incident types, are based on the following:

- Engine apparatus is not designed to be used in the manner which EMS activity requires. A volume of more than about 1,500 runs per year with an engine may seriously impair the long term usefulness of the apparatus.
- Dual-role personnel are presumed to have fire duties which occupy them for the majority of the normal work day. If they did not, they would be full-time EMS staff. More than approximately 2,500 runs per year with such personnel greatly limits their capacity as firefighters. They begin to spend 30% or more of their productive hours on EMS field activities, plus an additional amount of time on other EMS activity such as training and public education.
- A full-time unit operating on a twenty-four hour shift has limits on its effective capability at about 3,600 runs per year or 300 runs per month. This does not imply that units cannot make more runs, but rather that an EMS crew averaging more than ten to twelve runs per day is approaching its realistic utilization limit. (A study done by the Los Angeles City Fire Department concluded that 350 runs per month was the upper limit for a single emergency unit.)

These volume limits should not be applied to individual units in a multi-unit system. There are units in the City Fire Department which make far more than 3,600 runs per year and some which average much less. However, as an average for a system these limits appear reasonable. Certainly, limits must exist, and the limit should vary with the type of operation and vehicle utilized.

Each delivery system's Allocated Costs were adjusted upward to reflect their new cost levels at the maximum volume levels. Exhibit 5-H on page 5.21 illustrates the impact of these adjustments. The decrease in cost per run is greatest for those systems with high Direct Cost (Systems 1 to 5, and System 11) and not as large for the others.

System 4 changed only slightly because the Los Angeles City Fire Department is nearly at the maximum volume of 3,600 runs per unit. (They average about 3,400 currently.) System 6, which includes the County Fire Department operation, changes only slightly, even though their squads average fewer runs per year (about 1,900) than the maximum dual-role volume of 2,500. This occurs because a greater proportion of System 6 costs (as compared to System 4) are allocated or shared resource costs which increase as volume increases.

PROJECTED 1980 COSTS

Costs Assuming a Continuation of Existing Systems

Section 4 discussed the number of EMS vehicles likely to be in use in 1980 if existing provider operations are not modified significantly. If countywide volume increased to 450,000 incidents per year, approximately 194 response units would be needed to operate these systems. Total projected costs, computed using 1975 prices (assuming no inflation from 1976 to 1980) and the estimated current costs for the fourteen different systems in Exhibit 5-D are shown in Exhibit 5-I on page 5.22. Increases in costs were projected based on increased incident volume and the number of response units required to service that volume.

In all but one case, the current operational pattern remained intact. The County Fire Department, in order to service increased volume, would probably have to add squad vehicles and personnel. In this case, for cost calculation purposes, the additional personnel and equipment were assumed to be full-time EMS personnel as opposed to the dual-role fire paramedics now used by the County Fire Department, because the personnel would be added to meet EMS demand. The projected 1980 costs

for each system are shown in Exhibit 5-J on page 5.23. The projected net total costs in 1980 compared to those in 1975 are shown in Table B.

TABLE B
COMPARISON OF 1975 AND 1980
\$000's Omitted

	<u>1975</u>	<u>1980</u>	<u>Percent Change</u>
Total Vehicles	132	194	47%
Total Volume	285,000	450,000	58%
Costs (Net of Revenues)			
Direct	\$14,066	\$24,544	74%
Allocated	\$26,326	\$42,863	63%
Modified Fully Absorbed	\$34,332	\$53,951	57%

Impact of Inflation

The 1980 costs have been computed using current prices and would not, therefore, reflect actual expenditures in 1980. Table C provides a comparison of the net total costs, assuming average inflation rates of 4% and 8% during the five year period. As indicated, the impact is substantial, amounting to as much as an \$11.5 million increase in Direct Cost and a \$25.3 million increase in Modified Fully Absorbed Cost.

TABLE C
IMPACT OF INFLATION
\$000's Omitted

	<u>1980</u>	<u>1980 (At 4%)</u>	<u>1980 (At 8%)</u>
Direct Cost	\$24,544	\$29,862	\$36,063
Allocated Cost	\$42,863	\$52,149	\$62,680
Modified Fully Absorbed Cost	\$53,951	\$65,640	\$79,272

COST OF A UNIFORM COUNTYWIDE SYSTEM

In Section 4, the number of units required to operate a county wide EMS operation in 1980 were projected and are shown in Table D.

TABLE DPROJECTED RESPONSE UNIT REQUIREMENTS

<u>Performance Criteria</u>	<u>Demand Level</u>	<u>Approximate Vehicle Requirements</u>
Five Minute Average Response	High	176
	Average	159
	Low	133
95% Response Under Ten Minutes	High	132
	Average	115
	Low	91

Because a uniform countywide system does not currently exist, a number of assumptions were made regarding such a system in order to develop an estimate of the operating costs:

- All units would be similar to those used by Systems 1 through 5
- Personnel costs would approximate those of Systems 1 through 5
- Engine companies would assist on approximately 35% of all runs
- Variable staffing would be used to allow the maximum utilization of personnel and vehicles. Some personnel would be on twelve hour shifts with overtime paid at straight time rates with no added benefit costs
- Costs of administration and management overhead would approximate those of Systems 4 and 6
- Patients transported would be billed \$40.00; 70% of all runs would result in transports, and collections would average 50% of billings

- Other costs would be consistent with the overall cost methodology

If demand patterns did not change, and the five minute response time criteria were used, the system would require an average of 160 units:

- 133 units for seven hours each day
- 159 units for five hours each day
- 176 units for twelve hours each day

Using overtime and variable staff scheduling, approximately 950 people would be required to staff the units. This staffing level would result in direct salary and benefit costs of approximately \$25,500,000. Total Direct Costs for the 160 unit system would be approximately \$28,241,000. Table E shows a comparison of the 1980 net Direct Costs of an extension of the existing systems and the 160 unit county-wide system.

TABLE E
SYSTEM DIRECT COST COMPARISON
\$000's Omitted

	Extension of Existing Systems (194 Units)	Uniform Countywide System (160 Units)
Direct Cost ¹	\$30,681	\$28,241
Revenues ²	<u>6,137</u>	<u>6,360</u>
Net Total Cost	\$24,544	\$21,881

The 160 unit system would be capable of an overall average response time of five minutes, which is slightly better than the 5.2 minute average achieved today. The system would average 160 units on the street twenty-four hours per day and would have a net total Allocated Cost of \$186,400 per unit

¹Including private ambulance charges to individuals

²Including private ambulance revenues from individual payors

and \$66.29 per run. If the cost per unit were adjusted to reflect the fact that the system provides the equivalent performance of 176 units using the fixed staffing patterns prevalent in 1975 operations, the effective Allocated Cost would be \$169,500 per unit at 1975 prices.

If a uniform countywide system were developed to meet the response time criteria specified in the State Plan, approximately 115 units would be required on the average. Table F is a comparison of the Direct Costs of a 115 unit and 160 unit system. A 115 unit system would have an overall average response time of about six minutes. The additional cost of the one minute average improvement in response time between the two systems would be approximately \$7.2 million in Direct Costs.

TABLE F

UNIFORM COUNTYWIDE SYSTEM
DIRECT COST COMPARISON
 \$000's Omitted

	<u>160 Unit</u>	<u>115 Unit</u>
Direct Cost	\$28,241	\$21,000
Revenue	<u>6,360</u>	<u>6,360</u>
	\$21,881	\$14,640

SUMMARY OF CURRENT COUNTYWIDE
ANNUAL COSTS OF EMS OPERATIONS

ESTIMATED
\$000'S OMITTED

ITEM	TOTAL COSTS		
	<u>DIRECT</u>	<u>ALLOCATED</u>	<u>MFA</u>
SALARIES (DIRECT ONLY)	\$11,706	\$11,706	\$11,706
(ALLOCATED)	<u>-</u>	<u>8,690</u>	<u>8,690</u>
SUBTOTAL	11,706	20,396	20,396
VEHICLES (DIRECT ONLY)	1,397	1,397	1,397
(ALLOCATED)	<u>-</u>	<u>353</u>	<u>353</u>
SUBTOTAL	1,397	1,750	1,750
GENERAL-ADMIN. (DIRECT ONLY)	1,420	1,420	1,420
(ALLOCATED)	<u>-</u>	<u>1,969</u>	<u>1,969</u>
SUBTOTAL	1,420	3,389	3,389
OVERHEAD	<u>-</u>	<u>-</u>	<u>8,006</u>
TOTAL	\$14,523	\$25,535	\$33,541
PRIVATE AMBULANCE CHARGES TO INDIVIDUAL PATIENTS AND EAP PAYMENTS ¹	3,323	3,323	3,323
HOSPITAL SUPPORT CHARGES	<u>-</u>	<u>1,248</u>	<u>1,248</u>
TOTAL SYSTEM COST	\$17,846	\$30,106	\$38,112
REVENUES COLLECTED BY PRIVATE AMBULANCE COMPANIES	(2,184)	(2,184)	(2,184)
REVENUES COLLECTED BY PUBLIC AGENCIES	<u>(1,596)</u>	<u>(1,596)</u>	<u>(1,596)</u>
NET SYSTEM COST	<u>\$14,066</u>	<u>\$26,326</u>	<u>\$34,332</u>

¹ PRIVATE AMBULANCE CHARGES INCLUDE UNCOLLECTIBLES AND DRY RUNS WHICH ARE PAID BY EAP, AND SUBSIDIES PAID BY SOME CITIES WITH AMBULANCE CONTRACTS.

COST ELEMENTS AS A PERCENT OF
TOTAL COUNTYWIDE SYSTEM COST

ESTIMATED

<u>COST ELEMENT</u>	<u>DIRECT</u>	<u>ALLOCATED</u>	<u>MFA</u>
SALARIES:			
DIRECT	65.6%	38.9%	30.7%
ALLOCATED	<u>-</u>	<u>28.9</u>	<u>22.8</u>
TOTAL SALARIES	65.6	67.8	53.5
VEHICLES:			
DIRECT	7.8	4.6	3.7
ALLOCATED	<u>-</u>	<u>1.2</u>	<u>0.9</u>
TOTAL VEHICLES	7.8	5.8	4.6
GENERAL-ADMIN.:			
DIRECT	8.0	4.7	3.7
ALLOCATED	<u>-</u>	<u>6.5</u>	<u>5.2</u>
TOTAL GENERAL-ADMIN.	8.0	11.2	8.9
OVERHEAD	-	-	21.0
PRIVATE AMBULANCE CHARGES TO INDIVIDUAL PATIENTS AND EAP BILLINGS	18.6	11.0	8.7
HOSPITAL SUPPORT CHARGES	-	4.2	3.3
TOTAL SYSTEM COST	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>
REVENUES AS A PERCENT OF TOTAL COSTS:			
COLLECTIONS BY PRIVATE CO'S.	12.2%	7.3%	5.7%
COLLECTIONS BY PUBLIC AGENCIES	<u>8.9</u>	<u>5.3</u>	<u>4.2</u>
TOTAL REVENUE	21.1%	12.6%	9.9%

SUMMARY OF CURRENT ANNUALIZED
TAX BASE AND TOTAL SYSTEM COST

ESTIMATED
\$000'S OMITTED

<u>ITEM</u>	<u>TAX BASE COST</u>			<u>TOTAL SYSTEM COST</u>		
	<u>DIRECT</u>	<u>ALLOCATED</u>	<u>MFA</u>	<u>DIRECT</u>	<u>ALLOCATED</u>	<u>MFA</u>
SALARIES	\$11,706	\$20,396	\$20,396	\$11,706	\$20,396	\$20,396
VEHICLES	1,397	1,750	1,750	1,397	1,750	1,750
GENERAL-ADMIN.	1,420	3,389	3,389	1,420	3,389	3,389
OVERHEAD	--	--	8,006	--	--	8,006
EAP PAYMENT AND SUBSIDIES	1,139	1,139	1,139	1,139	1,139	1,139
PRIVATE AMBULANCE CHARGES TO INDIVIDUALS	--	--	--	2,184	2,184	2,184
HOSPITAL SUPPORT CHARGES	--	--	--	--	1,248	1,248
TOTAL	<u>\$15,662</u>	<u>\$26,674</u>	<u>\$34,680</u>	<u>\$17,846</u>	<u>\$30,106</u>	<u>\$38,112</u>
REVENUES COLLECTED						
- BY PRIVATE AMBULANCE CO'S	\$ --	\$ --	\$ --	\$ 2,184	\$ 2,184	\$ 2,184
- BY PUBLIC AGENCIES	1,596	1,596	1,596	1,596	1,596	1,596
	<u>\$ 1,596</u>	<u>\$ 1,596</u>	<u>\$ 1,596</u>	<u>\$ 3,780</u>	<u>\$ 3,780</u>	<u>\$ 3,780</u>
NET TOTAL	<u>\$14,066</u>	<u>\$25,078</u>	<u>\$33,084</u>	<u>\$14,066</u>	<u>\$26,326</u>	<u>\$34,332</u>

NET CURRENT COSTS BY SYSTEM

ESTIMATED

<u>SYSTEM NUMBER</u>	<u>1975 INCIDENT VOLUME</u>	<u>NUMBER OF UNITS</u>	<u>OPERATIONAL COSTS</u> \$000'S OMITTED		
			<u>DIRECT</u>	<u>ALLOCATED</u>	<u>MFA</u>
1	10,750	7	\$ 1,410	\$ 2,369	\$ 3,169
2	16,150	8	1,088	2,848	3,713
3	2,200	2	371	469	616
4	148,334	50	8,183	11,525	14,639
5	6,750	4	784	1,112	1,377
6	59,075	33	1,419	5,450	7,703
7	5,100	4	120	442	540
8	2,850	3	40	208	263
9	6,500	5	187	375	415
10	9,600	6	184	757	890
11	1,900	2	190	338	460
12	4,500	6	84	414	525
13	300	1	3	6	7
14	250	1	3	13	15
TOTAL	<u>274,259</u>	<u>132</u>	<u>\$14,066</u>	<u>\$26,326</u>	<u>\$34,332</u>

COMPARISON OF SYSTEM 4 AND SYSTEM 6 COST COMPONENTS

ESTIMATED

	DIRECT		ALLOCATED		MFA	
	SYSTEM 4	SYSTEM 6	SYSTEM 4	SYSTEM 6	SYSTEM 4	SYSTEM 6
SALARIES:						
DIRECT	85.0%	12.9%	62.8%	4.9%	50.5%	3.7%
ALLOCATED	--	--	15.2	50.9	12.2	37.8
TOTAL	85.0	12.9	78.0	55.8	62.7	41.5
VEHICLES:						
DIRECT	6.3	17.9	4.6	6.9	3.7	5.1
ALLOCATED	--	--	1.0	0.9	0.8	0.7
TOTAL	6.3	17.9	5.6	7.8	4.5	5.8
GENERAL-ADMIN. :						
DIRECT	7.3	8.1	5.4	3.1	4.3	2.3
ALLOCATED	--	--	4.5	5.6	3.6	4.2
TOTAL	7.3	8.1	9.9	8.7	7.9	6.5
OVERHEAD	--	--	--	--	19.6	25.7
PRIVATE AMBULANCE CHARGES TO INDIVIDUAL PATIENTS AND EAP PAYMENTS	1.4	61.1	1.1	23.4	0.9	17.4
HOSPITAL SUPPORT	--	--	5.4	4.3	4.4	3.2
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
REVENUES AS PERCENT OF TOTAL COSTS:						
COLLECTED BY PRIVATE CO.'S	1.0%	41.7%	0.7%	15.9%	0.6%	11.9%
COLLECTED BY PUBLIC AGENCIES	12.3	1.5	9.1	0.6	7.3	0.4
TOTAL	13.3%	43.2%	9.8%	16.5%	7.9%	12.3%

**SUMMARY OF CURRENT NET COST PER RUN
AND COST PER UNIT BY DELIVERY SYSTEM**

ESTIMATED

<u>SYSTEM No.</u>	<u>COST PER RUN</u>			<u>COST PER UNIT</u>		
	<u>DIRECT</u>	<u>ALLOCATED</u>	<u>MFA</u>	<u>DIRECT</u>	<u>ALLOCATED</u>	<u>MFA</u>
1	\$131.16	\$220.37	\$294.79	\$201,429	\$338,429	\$452,714
2	67.37	176.35	229.91	136,000	356,000	464,125
3	168.64	213.18	280.00	185,500	234,500	308,000
4	55.17	77.70	98.69	163,660	230,500	292,780
5	116.15	164.74	204.00	196,000	278,000	344,250
6	24.02	92.26	130.39	43,000	165,152	233,424
7	23.53	86.67	105.88	30,000	110,500	135,000
8	14.04	72.98	92.28	13,333	69,333	87,667
9	28.77	57.69	63.85	37,400	75,000	83,000
10	19.17	78.85	92.71	30,667	126,167	148,333
11	100.00	177.89	242.11	95,000	169,000	230,000
12	18.67	92.00	116.67	14,000	69,000	87,500
13	10.00	20.00	23.33	3,000	6,000	7,000
14	12.00	52.00	60.00	3,000	13,000	15,000
AVERAGE	\$ 49.35	\$ 92.37	\$120.46	\$106,560	\$199,440	\$260,090

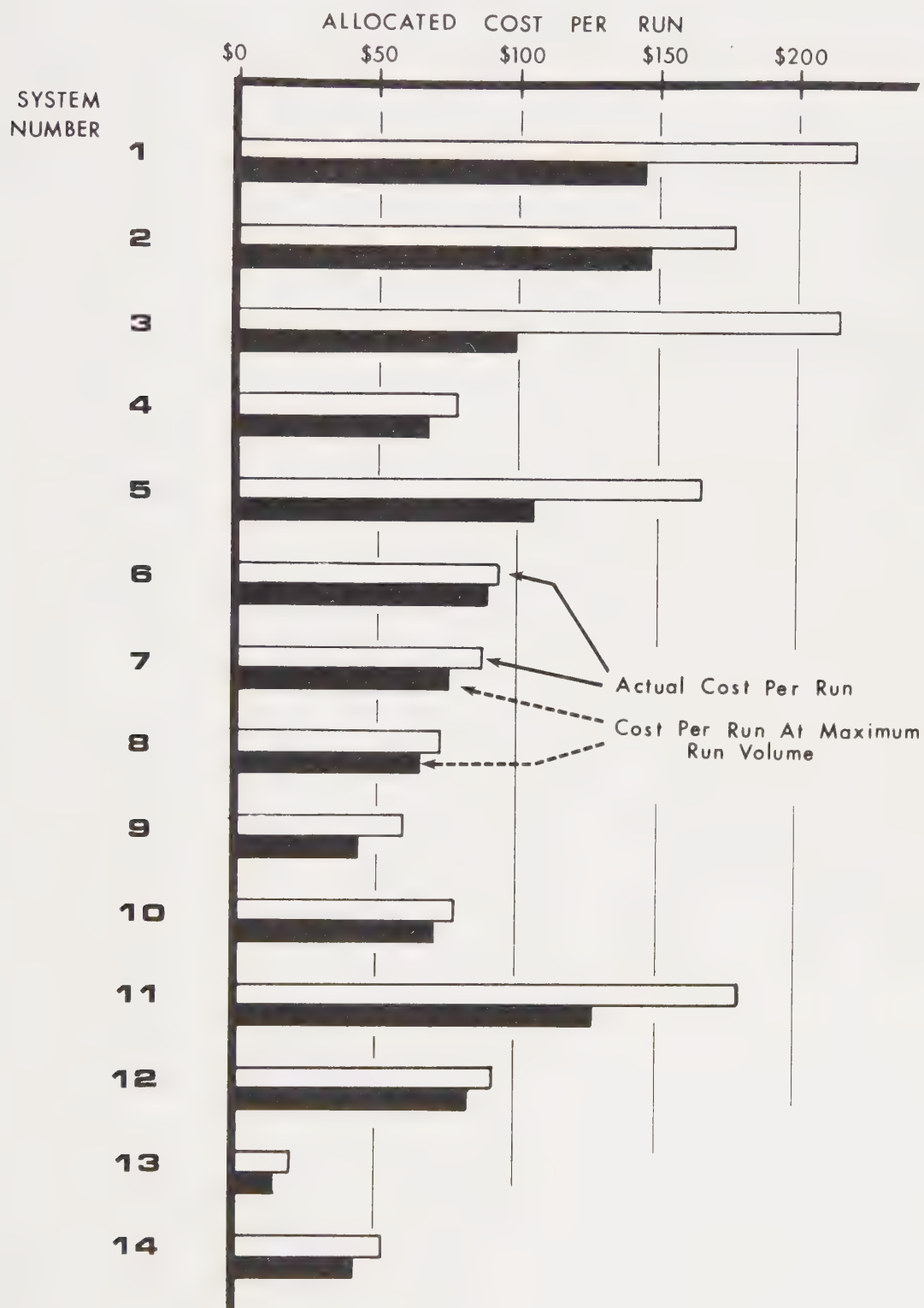
VARIATION OF COST PER RUN WITH INCREASED VOLUME

HYPOTHETICAL EXAMPLES

<u>SYSTEM</u>	<u>VOLUME = 1,000 RUNS</u>				<u>VOLUME = 1,500 RUNS</u>			
	<u>DIRECT COST</u>	<u>SHARED COST</u>	<u>TOTAL ALLOCATED COST</u>	<u>COST PER RUN</u>	<u>DIRECT COST</u>	<u>SHARED COST</u>	<u>TOTAL ALLOCATED COST</u>	<u>COST PER RUN</u>
X	\$ 5,000	\$1,000	\$ 6,000	\$6.00	\$ 5,000	\$ 1,500	\$ 6,500	\$4.33
Y	3,000	3,000	6,000	6.00	3,000	4,500	7,500	5.00
Z	<u>2,000</u>	<u>4,000</u>	<u>6,000</u>	<u>6.00</u>	<u>2,000</u>	<u>6,000</u>	<u>8,000</u>	<u>5.33</u>
TOTALS	\$10,000	\$8,000	\$18,000	\$6.00*	\$10,000	\$12,000	\$22,000	\$4.89*

*AVERAGE

VARIATION OF ALLOCATED COST PER RUN WITH VOLUME
ESTIMATED



EXTENSION OF THE EXISTING SYSTEM

1980 EMS COST

ESTIMATED

\$000's OMITTED

<u>COST ELEMENT</u>	<u>DIRECT</u>	<u>ALLOCATED</u>	<u>MFA</u>
SALARIES:			
DIRECT	\$20,596	\$20,596	\$20,596
ALLOCATED	-	12,519	12,519
TOTAL	20,596	33,115	33,115
VEHICLES:			
DIRECT	2,285	2,285	2,285
ALLOCATED	-	600	600
TOTAL	2,285	2,885	2,885
GENERAL-ADMIN.:			
DIRECT	2,400	2,400	2,400
ALLOCATED	-	3,200	3,200
TOTAL	2,400	5,600	5,600
OVERHEAD	-	-	11,088
PRIVATE AMBULANCE CHARGES TO INDIVIDUAL PATIENTS AND EAP BILLINGS	5,400	5,400	5,400
HOSPITAL SUPPORT CHARGES	-	2,000	2,000
TOTAL COST	\$30,681	\$49,000	\$60,088
REVENUES:			
COLLECTIONS BY PRIVATE COMPANIES	\$ 3,523	\$ 3,523	\$ 3,523
COLLECTIONS BY PUBLIC AGENCIES	2,614	2,614	2,614
TOTAL	6,137	6,137	6,137
NET TOTAL COST	<u>\$24,544</u>	<u>\$42,863</u>	<u>\$53,951</u>

PROJECTED 1980 NET COSTS BY SYSTEM

ESTIMATED

<u>SYSTEM NUMBER</u>	<u>1980 INCIDENT VOLUME</u>	<u>NUMBER OF UNITS</u>	<u>NET OPERATIONAL COST</u> \$000'S OMITTED		
			<u>DIRECT</u>	<u>ALLOCATED</u>	<u>MFA</u>
1	19,200	13	\$ 2,612	\$ 4,325	\$ 5,787
2	26,000	12	1,592	4,425	5,774
3	3,000	2	369	503	660
4	243,000	84	13,894	19,319	24,493
5	13,400	7	1,382	2,033	2,515
6	98,000	44	3,603	8,499	10,151
7	8,600	6	188	731	893
8	4,200	3	36	284	359
9	10,000	5	285	575	636
10	13,600	7	256	1,067	1,254
11	2,700	2	201	412	558
12	7,400	7	120	663	840
13	500	1	3	8	9
14	400	1	3	19	22
TOTAL	<u>450,000</u>	<u>194</u>	<u>\$24,544</u>	<u>\$42,863</u>	<u>\$53,951</u>

SECTION 6

PRIVATE AMBULANCE COMPANY OPERATIONS

INTRODUCTION

There are twenty-two private ambulance companies currently providing transport service within Los Angeles County. For the purpose of this survey the nineteen companies belonging to the Los Angeles County Ambulance Association were reviewed in detail. The Ambulance Association provided liaison between the project team and the companies and encouraged the companies to cooperate. These nineteen companies accounted for 99% of the emergency runs made by private companies in response to requests from public agencies in Los Angeles County in 1975.

The private companies provide several types of ambulance services in the County. They provide emergency transportation when requested by a public agency, and in some areas they are the primary emergency medical service response unit. Private companies also perform emergency transports at the request of individual citizens. A significant portion of the companies' business is nonemergency transports, including transports of patients to hospitals from their homes or doctors' offices, or between hospitals. The County contracts with private companies for transportation of patients in the custody of law-enforcement officers. There are also contracts for the transportation of patients to and between County facilities when the County vehicles are unable to handle the required workload.

Most of the companies supplement their ambulance operations with other businesses. Fifteen of the nineteen companies operate sickroom equipment sales and rental businesses, and two have mortuary businesses. Two companies provide only ambulance service.

The nineteen companies and their locations are:

Adams Ambulance	-	South Gate
Aids Ambulance	-	Whittier
Antelope Valley Ambulance	-	Lancaster
Arcadia-Monrovia Ambulance	-	Monrovia
Associate Ambulance	-	Bell Gardens
Bowers Ambulance	-	Long Beach
Carson Ambulance	-	Carson
Community Ambulance	-	San Dimas
Crippen Ambulance	-	Covina
Dolphin Ambulance	-	Pasadena
Goodhew Ambulance	-	Los Angeles

McCormick Ambulance	-	Inglewood
Newhall Ambulance	-	Newhall
Professional Ambulance	-	Glendale
Pruner Ambulance	-	Thousand Oaks
Risher Ambulance	-	Montebello
Schaefer Ambulance	-	Los Angeles
Snyder Ambulance	-	Van Nuys
Wilson Ambulance	-	Palmdale

These companies vary significantly in sales volumes, resources, and operating characteristics. Approximately half of the companies are relatively small, operating less than five vehicles and making fewer than 5,000 runs per year. Six companies are of medium size, operating five to ten vehicles and making 10,000 to 20,000 runs per year. Only two companies, Goodhew and Schaefer, are substantially larger than the others. Combined they operate eighty-one vehicles in Los Angeles County and account for nearly half of the total private ambulance runs.

REVIEW METHODOLOGY

The private ambulance company reviews consisted of visits to each company to obtain data and interview management personnel regarding company operations. The reviews covered the major aspects of each company's operations and included:

- A description of overall business operations
- The geographic areas and cities serviced by the company
- The address and description of each response location and the level of emergency personnel and equipment at each
- An inventory and description of emergency vehicles
- A description of medical and communications equipment utilized
- A description of communications and interface capabilities with fire, police, hospitals and emergency vehicles, as well as a description of emergency communications equipment
- An inventory of personnel, including number employed, training, length of service, salaries, fringe benefits, and turnover rates

- The details of current contracts for ambulance services including rates, contractual services, and the contractual period
- A listing of noncontractual rate structures utilized in incorporated areas, if different from EAP rates
- A description of billing procedures, controls over cash payments and follow-up, and collection efforts for unpaid accounts

Additional data, such as run volumes, was collected by reviewing company records and supporting documentation. Performance statistics were tabulated by sampling company documents. Sample sizes ranged from 125 to 1,400 per company, depending on the number of response locations and the number of total runs.

The runs sampled were all Code 3 responses (flashing red lights and siren). Generally, runs sampled were in response to calls from public agencies requesting transports for emergency patients. Code 3 responses to calls from private individuals were sampled for locations which receive a small number of calls from public agencies.

Financial data collected at each company formed the basis for the preparation of a financial profile showing revenue, costs, and profit for the combined companies. All financial data was obtained from books, records, and financial statements of the companies. Both costs and revenues pertaining to operations outside of Los Angeles County or to nonambulance operations were segregated and excluded from the analysis. All exclusions were discussed with and agreed to by each company's management.

Ambulance bills for emergency runs were sampled to determine the average charge to patients and the average amount reimbursed by the County for bills not paid by the patient. The difference between the average bill to the patient and the average reimbursement from the County was the average loss or writeoff to the ambulance companies when the patient did not pay his bill for a run covered by an EAP contract.

Comparison of ambulance company cost structures was accomplished by computing cost on a per run basis. Costs were identified as:

- Personnel Cost: includes total company wages and salaries for direct and indirect personnel
- Operations Cost: includes vehicle expenses such as depreciation, insurance, gas and oil,

ambulance supplies, and administrative expenses such as rent, office supplies, telephone, utilities, accounting and legal

- Maintenance Cost: includes all repairs and maintenance costs on vehicles, equipment and facilities
- Other Cost: includes all other costs such as payroll taxes, workmen's compensation, other group insurance, bad debt expense, interest, and advertising

A major objective of the survey was to review private ambulance company profits. Since the County has no standard which defines a reasonable profit, the City of Los Angeles Board of Public Utilities and Transportation's guideline was chosen with the concurrence of the Project Steering Committee. This guideline allows a maximum profit after taxes of 8% of revenue. Since the financial data obtained from the companies was "before taxes", a "before tax" rate was computed which corresponds to the 8% guideline. Using 1975 tax rates, the maximum allowable before tax profit levels ranged from 11% to 16%, depending on company income.

OPERATIONAL AND ORGANIZATIONAL PROFILE

Response Locations

The nineteen private ambulance companies staff and operate sixty-seven full-time response locations in Los Angeles County. Exhibit 6-A on page 6.10 lists the number of response locations by company. A response location is a permanent location with crew's quarters where a unit is stationed when not responding to a call. It represents an emergency resource capability for the surrounding area.

Response Vehicles

The nineteen companies operated 154 EMT I-equipped ambulances and twenty-three paramedic-equipped ambulances in the County. Exhibit 6-A provides the details by company. Of the 177 vehicles, 105 were van-type and seventy-two were Cadillac-type. Of these vehicles, 172 were 1970 model year or newer. Internal company documentation indicated that standard equipment lists for these vehicles generally exceed California Highway Patrol equipment requirements and meet or exceed

County Health Department standards. Each vehicle was not inspected to determine compliance with these requirements; however, those vehicles which were seen appeared clean, well maintained and fully equipped.

Vehicle Utilization

Vehicle utilization for the private ambulance companies varied widely, depending on service area characteristics and company operating policies. Overall, the companies averaged 1,682 runs per vehicle annually. Individual company averages ranged from 582 runs to 2,408 runs per vehicle annually. Exhibit 6-A on page 6.10 contains a listing of the annual run volume by company.

Response Times

In order to determine response times from the private ambulance locations for emergency transport requests, 6,814 emergency runs were sampled. Response time data was obtained for fifty-three separate response locations. Since four of the companies' records did not provide data by response location, response times were calculated for those companies as a whole (Appendix G contains individual company response times by location).

For seven companies, 90% of the response times for emergency runs were under ten minutes. The highest percentage of response times under ten minutes for any individual company was 98.3%, while the lowest was 42% (located in a rural area). Twenty-one of the fifty-three locations had 90% of their response times under ten minutes.

The mean response time for all the emergency calls in the sample was 7.0 minutes. Of the total calls, 416 could be identified as private or noncontract calls (calls received from private citizens rather than public agencies). When these calls were excluded from the sample, the mean response time decreased to 6.6 minutes.

Service Times

Emergency runs were sampled to calculate the average service time of an emergency call. For purposes of the review, service time was defined as the elapsed time between the receipt of the request for service and the time when the ambulance and crew were "clear" for another call. If the "time clear" was not recorded on internal company records, it was estimated by

using the time the vehicle arrived at the hospital and adding five minutes. The five minute estimate was based upon observations and upon discussions with individual ambulance operators. The mean service time of an emergency call for the fifty-three locations sampled was 33.0 minutes. The mean service time for the individual locations ranged from a low of 20.6 minutes for an operator in a central city service area, to 59.6 minutes for an operator in a rural area (Appendix G contains individual company service times by location). Locations in rural, mountainous, and less populated areas had longer service times due to the greater distances traveled to the scene and to the base hospital, and due to reduced speeds dictated by the geography.

Emergency Personnel

The nineteen private ambulance companies employed 112 paramedics and 536 EMT I's. Exhibit 6-A on page 6.10 lists the number of paramedics and EMT I personnel by company. The average length of employment for paramedics was 2.1 years and for EMT I's was 1.7 years. Overall industry turnover was 44% per year and was calculated by dividing the total personnel terminated during the 1975 calendar year by total current employees.

Salaries in the private sector are considerably lower than those in the public sector for comparable positions. The average annual salary for a paramedic in a private ambulance company was between \$10,309 and \$10,685. The average annual salary for an EMT I in a private ambulance company was between \$8,719 and \$8,794. The range in both paramedic and EMT I average salaries is a function of different compensation methods used.

COST AND REVENUE CHARACTERISTICS

Rate and Revenue Structure

The rate structure for private ambulance charges to potential EAP patients is set forth in exhibits in the EAP Emergency Ambulance Service Agreement. Exhibit A of the Agreement sets the rates to be charged by ambulance companies for emergency medical services in unincorporated areas of the County. Exhibit B sets a lesser rate which the County will pay the companies when they are unable to collect from patients for EAP-eligible transports. The current Exhibit A rate structure for private ambulance transport allows a base rate of \$40.00, with additional charges of \$2.00 per mile for mileage over five miles, \$5.00 for night calls, \$5.00 for oxygen, \$7.00 per fifteen minutes of waiting time, and \$5.00 for special

handling. The Exhibit B rate provides for reimbursement of \$37.50 for the first five miles and \$1.50 for each additional mile. Both exhibits specify reduced rates when more than one patient is transported.

It was determined that each of the ambulance companies is utilizing the Exhibit A rate structure in unincorporated areas. In addition, thirteen of the nineteen companies reviewed are utilizing this identical rate structure in the incorporated areas they service, even though they are not legally required to do so. The six companies whose rates vary between unincorporated and incorporated areas are each charging \$45.00 as a base transport rate. Furthermore, when an EAP patient is transported many of the private companies are not taking advantage of the special handling charge. This charge, however, is typically made for private patients.

A sample of EAP bills indicated that the average "Exhibit A" amount charged to patients for an EAP transport was \$50.15. The average "Exhibit B" amount paid by the County for the uncollectible accounts in this sample was \$36.57. The private companies are losing \$13.58, or 27.1%, in revenue, on runs paid by the County through the EAP program when the patients do not pay.

Approximately one-fourth of the private ambulance company bills to EAP-eligible patients are uncollectible and are consequently paid by the County. The payments by the County under the Emergency Aid Program totaled approximately \$1,100,000 in 1975¹ and represented 7.3% of the industry's total revenue. The companies also received 9.6% of their total revenue through additional payments by the County under the Patient Overflow Program. Therefore, in 1975, payments by the County accounted for 16.9% of the industry's total revenue. Exhibit 6-B on page 6.11 presents the revenue percentages for each of the companies.

Despite the fact that revenue paid through the Emergency Aid Program represents a significant writeoff to the companies providing the service, it does provide them with a level of marginal revenue that might normally be uncollectible without the program. In addition, private ambulance companies obtain approximately 29.6% of their total revenue as a result of calls from public agencies in jurisdictions which participate in the Emergency Aid Program.

¹Approximately \$650,000 of this money was repaid to the County by the cities in which the transports occurred.

Cost Structure

Operating costs for the companies were divided into four major categories: personnel, operations, maintenance, and other costs. These costs were developed for each of the nineteen companies; the industry averages are presented below in Table A on a cost per run basis.

TABLE A
AVERAGE COST PER RUN

Personnel	\$21.83
Operations	10.61
Maintenance	1.96
Other	<u>8.92¹</u>
TOTAL	\$43.32

The costs per run for the individual companies varied significantly from the industry average and ranged from a low of \$34.81 to a high of \$80.06. However, the costs per run for eight of the nineteen companies were between \$41.00 and \$47.00.

Profitability Structure

The average profit before taxes for the nineteen companies reviewed was 4.8% (expressed as a percentage of revenue). The lowest company before tax profit was minus 18.9%. The highest before tax profit percentage was 12.5%, which converted to an after tax rate of approximately 7.7%. Six of the nineteen companies experienced a loss on ambulance operations for their most recent year.

¹Other costs per run of \$8.92 are made up of \$1.66 for payroll taxes, \$1.42 for workmen's compensation, \$0.66 for group insurance, \$3.55 for bad debt expense, and the remaining \$1.63 for interest, advertising, travel, dues and subscriptions, and other miscellaneous expenses.

The review and analysis indicated that none of the nineteen companies reviewed earned profits exceeding the 8% after tax guideline, and that the profit for the industry as a whole is substantially below the guideline amount.

The two primary reasons for the low level of profit in the industry are public agency reimbursement at rates below average company cost and a consistently high bad debt experience. A substantial portion of patient transports is paid for by Medicare, Medi-Cal or the County of Los Angeles under the Emergency Aid or Patient Overflow Program contracts. The rates of reimbursement for all three of these sources are less than the average cost per run for the industry. Although these sources are contributing significant incremental revenue to the industry, they do not contribute to overall profit on a per run basis. In addition, among patients not covered by a third party payment source, the level of nonpayment is high. For the companies reviewed, private patient bad debt writeoffs exceeded \$1,069,000 or 7.8% of total net ambulance revenue.

PRIVATE AMBULANCE OPERATIONS PROFILE

TOUCHE ROSS & CO.

EXHIBIT 6-A

COMPANY	PARAMEDIC CAPABILITY	TOTAL NUMBER OF RESPONSE LOCATIONS	TOTAL NUMBER OF VEHICLES		TOTAL ANNUAL RUN VOLUME ¹	DRY RUNS INCLUDED IN TOTAL	TOTAL NUMBER OF EMT PERSONNEL	
			EMT I	EMT II			EMT I	EMT II
ADAMS	No	4	6	-	13,144	643	20	2
AIDS	YES	5	6	3	10,881	1,401	14	10
ANTELOPE VALLEY	YES	1	3	2	3,274	335	9	10
ARCADIA-MONROVIA	No	2	5	-	5,176	323	11	-
ASSOCIATE	No	2	3	-	4,675	126	13	-
BOWERS	No	6	14	-	33,721	5,172	38	-
CARSON	No	1	3	-	4,302	708	8	-
COMMUNITY	YES	2	1	2	1,854	160	3	8
CRIPPEN-COVINA	No	3	5	-	7,825	640	17	-
DOLPHIN	YES	5	6	4	18,488	1,788	31	28
GOODHEW	No	10	32	-	56,909	1,200 ²	123	-
MCCORMICK	YES	3	3	3	11,971	650 ²	12	5
NEWHALL	No	1	4	-	3,106	566	24	3
PROFESSIONAL	YES	3	6	3	12,357	233 ²	18	19
PRUNER	YES	2	3	1	3,811	821	13	4
RISHER	No	2	3	-	4,874	344	11	-
SCHAEFER	YES	11	40	5	92,110	2,530 ²	142	23
SNYDER	No	3	8	-	11,348	412	16	-
WILSON	No	<u>1</u>	<u>3</u>	<u>-</u>	<u>1,742</u>	<u>295</u>	<u>13</u>	<u>-</u>
		<u>67</u>	<u>154</u>	<u>23</u>	<u>301,568</u>	<u>18,347</u>	<u>536</u>	<u>112</u>

¹ INCLUDES ALL PRIVATE AMBULANCE RUNS INCLUDING DRY RUNS

² ESTIMATED BASED ON SAMPLE

PRIVATE AMBULANCE COMPANIES
EAP AND OVERFLOW REVENUE PROFILE

<u>COMPANY</u>	PERCENT OF TOTAL REVENUE		<u>TOTAL</u>
	<u>PAID BY COUNTY THROUGH EAP</u>	<u>PAID BY COUNTY THROUGH OVERFLOW</u>	
ADAMS	20.5	11.5	32.0
AIDS	11.4	8.4	19.8
ANTELOPE VALLEY	7.0	8.2	15.2
ARCADIA-MONROVIA	12.5	9.3	21.8
ASSOCIATE	15.1	11.8	26.9
BOWERS	2.8	3.5	6.3
CARSON	19.7	18.1	37.8
COMMUNITY	9.9	1.2	11.1
CRIPPEN-COVINA	13.6	10.2	23.8
DOLPHIN	8.7	9.2	17.9
GOODHEW	3.6	10.2	13.8
MCCORMICK	11.3	14.3	25.6
NEWHALL	18.9	4.4	23.3
PROFESSIONAL	0.7	15.6	16.3
PRUNER	18.8	1.9	20.7
RISHER	7.8	7.9	15.7
SCHAEFER	5.9	10.0	15.9
SNYDER	5.6	13.3	18.9
WILSON	22.1	10.2	32.3
INDUSTRY WEIGHTED AVERAGE	7.3	9.6	16.9

SECTION 7

OBSERVATIONS AND RECOMMENDATIONS

INTRODUCTION

The results of this survey indicate that major organizational and operational changes should occur in the delivery of emergency medical services in the County by 1980. In addition, as the current operations were reviewed and analyzed, a number of opportunities for shorter-term improvements were identified. These included improvements in performance and management control, reductions in operating costs, and increases in service levels. The implementation of these shorter-term improvements will provide a double benefit. In addition to enhancing the current operation, these improvements will facilitate the implementation of the 1980 organizational and operational changes.

OVERALL ORGANIZATION AND OPERATION OF EMERGENCY MEDICAL SERVICES BY 1980

Emergency Medical Services in 1975

In 1975 there were forty primary jurisdictional providers of emergency medical services. These providers ranged in size from a one unit operation which responded to approximately 250 incidents, to a thirty-nine unit operation which responded to over 134,000 incidents. Each of these providers has different operating policies and procedures and has responsibility for providing emergency medical services within proscribed jurisdictional boundaries.

The service levels in the County are currently high and generally exceed the guidelines established in the State Plan. The overall countywide response time is 5.2 minutes. Individual providers have average response times that range from less than three minutes to slightly more than six minutes.

The Direct Cost of emergency medical services in the County in 1975 was an estimated \$14,000,000 after revenues collected by public and private agencies were deducted. This resulted in a net Direct Cost per incident of approximately \$49.00. The cost-effectiveness of each delivery system varied and ranged from approximately \$12.00 per incident for a small volunteer operation to over \$131.00 per incident for relatively elaborate operations with low utilization. The Direct Cost of putting a response unit on the street showed similar variations, ranging from \$3,000 to \$201,000 and averaging \$106,500. The

major providers in the County are currently relatively cost-effective and employ service delivery methods that are generally compatible with the area and the demand that they service.

There has been a significant growth in the number of emergency medical incidents in the County, from less than 150,000 incidents in 1970 to over 285,000 incidents in 1975. The introduction of additional response units to meet the rapid growth in demand plus the introduction of more sophisticated services, such as the paramedic program in 1970, have strained the management capability of the current operations in the County. Because there is no single agency with the authority to manage and control the delivery of services countywide, numerous operating problems developed, which are discussed later in this section. The service is currently reasonably effective, however, because lives are at stake and because emergency medical services are provided by relatively well-run public and private agencies.

Emergency Medical Services in 1980

For 1980, approximately 450,000 emergency medical incidents are projected. If the current operational and jurisdictional patterns were maintained, an estimated 194 response units would be required to provide the current countywide service level of approximately a five minute average response time. The net Direct Cost of the 1980 operation would be an estimated \$24,500,000 at 1975 prices.

At the volume projected for 1980, current operating problems would be magnified. The majority of the primary providers would become less cost-effective as their relatively small service areas caused an increasingly suboptimum allocation of resources. As these providers increase the number of response units to meet the additional volume, and as their operations mature, it will become increasingly difficult to implement countywide changes to improve provider operations and service levels.

Furthermore, if past developments in medical technology are an indication of future trends, rapid innovations in medical techniques and procedures will continue. These changes will increase the complexity of EMS and the specialization of EMS response personnel. As specialization increases, it will become more difficult for dual-role firemen to adequately fulfill both roles. Although dual-role personnel may be cost-effective now, their long-term effectiveness may be reduced.

If a uniform, countywide system were implemented, approximately 160 response units would be required on the average to service

1980 demand. The 160 unit system would be able to achieve an overall response time of approximately five minutes. If the response units had patient transport capability and were each staffed with two full-time paramedic personnel, the net Direct Cost would be an estimated \$21,900,000 at 1975 prices. The uniform system would result in an estimated countywide savings in 1980 of \$2,600,000 in Direct Cost.

In addition to being more cost-effective on a countywide basis by 1980 than a continuation of the current operations, the uniform system would be easier to manage and control. Performance levels and the quality of care could be more easily managed. Operating procedures and standards for performance would be more easily promulgated and enforced. Standardized data collection, management information and administrative systems would be more easily implemented. Dispatching operations could be centralized and many of the current communications problems could be resolved.

Whether or not 911 is implemented countywide, citizen access to emergency medical services would be facilitated. A single, seven-digit EMS telephone number could be installed for the system to provide uniform access. Additionally, public education could be better coordinated, and citizen identification of whom to call would be improved as medical emergencies would be associated with the single operation rather than with forty or more independent providers.

RECOMMENDATION

A uniform, countywide system for providing emergency medical services should be established in Los Angeles County by 1980.

IMPLEMENTATION OF A UNIFORM, COUNTYWIDE SYSTEM

Overall Organizational Alternatives

A uniform, countywide emergency medical services system could be achieved by 1980 through the implementation of a number of alternative organizational structures. The alternatives range from an informal association of providers to a formal governmental agency. For example, a voluntary provider organization is a conceivable approach. Such a voluntary approach would be of limited value, however, unless the organization were able to enforce policies which would ensure uniformity of operation.

Another approach could be a regionalized system composed of providers linked through expanded mutual and automatic aid agreements. This approach could reduce future costs by a limited improvement in the allocation of response units, and could result in relatively uniform delivery systems within regional areas. A regionalized system, however, would be essentially voluntary and could make countywide coordination and planning difficult. Furthermore, although jurisdictional boundary problems could be reduced, they would still exist.

There are however, three organizational alternatives that could be effective and should be considered in greater detail. These are:

- An operating department within the County governmental structure
- A governmental authority created by a joint powers agreement among the County and independent cities
- A public utility or private corporation

County Department:

The uniform, countywide system could be implemented as either a new County department, as a division of the County Fire Department, or as a division of the Department of Health Services. If the system were implemented within the County Fire Department, the problems involved with transferring fire personnel with EMS skills to a new non-fire agency would be reduced. Each of these approaches could take advantage of existing County administrative systems and support services and would not require additional out-of-pocket expenditures for maintenance facilities, data processing equipment, office space, and communications networks.

A County department may have additional advantages depending upon the future interpretation of Section 17000 of the Welfare and Institutions Code, the primary statute which describes the County's responsibility for providing emergency medical services to indigents. Under the current interpretation of this section, the County's field emergency medical services responsibility is limited to the payment of ambulance transport charges which the ambulance companies cannot collect from individual patients for incidents in unincorporated areas.

There has been recent controversy regarding the existing interpretation of Section 17000. Several independent cities have argued that the County should also be responsible for uncollectible patient transportation charges in incorporated areas

of the County, and should be responsible for field stabilization countywide as well. At the same time, however, the County is currently paying for uncollectible transport charges without applying any test of indigency. If the County's responsibility were determined to be broader, it may be necessary to develop and apply a test of indigency. The issues in the controversy are complex and the County's precise responsibility under the statute may be difficult to determine. Unless the parties can mutually agree to a definition of responsibility, the issue will probably require a judicial resolution.

Depending upon the resolution of this controversy, the County may become a primary funding source for EMS by 1980. If the County were required to fund a significant portion of emergency medical services, it would probably want direct control over expenditures; and the County department alternative would provide the most direct control.

This alternative, however, could be unpopular with the individual jurisdictions which may be reluctant to allow the County to become the sole provider of emergency medical services. In order to implement this alternative, enabling legislation may be required.

There are two potentially feasible funding arrangements for this alternative:

- The County could bill the individual jurisdictions for their share of the costs based upon their proportional service volumes or other cost allocation rules
- A special tax district similar to the one used to fund the Consolidated Fire Protection Districts could be established

Joint Powers Authority:

A joint powers authority would be independent of existing political jurisdictions, but at the same time would be responsible to them through a Board of Directors. The responsibilities of the participating parties could be clearly defined, and the authority could ensure fair representation of individual jurisdictions. The joint powers authority may be the only feasible organizational alternative if the County elects not to become the sole provider of emergency medical services or finds it legally or politically impossible to do so. The authority could potentially utilize government administrative systems and support services and avoid adding to existing governmental overhead costs.

There are two possible sources of funding for an authority: a special tax district, or an arrangement for billing the participating jurisdictions at a rate based on an equitable formula which considers population, level of services provided, contributions of personnel and equipment, and other factors.

Public Utility or Private Corporation:

The uniform, countywide system could be structured as a public utility or a private corporation. An advantage of this alternative is that it could potentially provide a high level of service at a lower cost than a governmental agency. For example, private ambulance company personnel are currently paid from 40% to 50% less in salaries and benefits than corresponding public employees. In the event that a private countywide system were established, salary costs would probably increase, especially if union agreements were reached which were similar to those now in effect for public providers. However, if a net savings of 25% of salary and benefit costs could be achieved, it would result in a total Direct Cost savings of about \$6.7 million annually in the operation of the uniform system at 1975 prices. The public utility or private corporation, however, would have to develop and operate, or contract for, complex management and administrative systems and sophisticated support services. These systems and services could represent an additional Direct Cost of from \$2.0 to \$3.0 million per year.

The public utility or private corporation alternative could be controlled through regulatory procedures similar to those currently used to control public utilities. Rates for services, allowable costs, acceptable profit levels and a fair rate of return on invested capital would have to be established and controlled. Financial and operating results would have to be reviewed periodically, and auditing procedures would have to be implemented. In addition, comprehensive contractual requirements would have to be developed to ensure a cost-effective operation and acceptable service levels.

The revenue generated through user charges by either a public utility or a private corporation would probably not fully cover the costs of service. Costs could be partially offset by the County through the Emergency Aid Program. The remainder of the costs would have to be covered by subsidies from individual jurisdictions or by a prepaid subscription fee paid by private citizens.

Conclusion :

Each of the major organizational and funding alternatives could be viable and cost-effective. The selection of the most feasible alternatives for organizing and funding a uniform, countywide system in 1980 would depend upon two major factors:

- The degree of resistance on the part of local jurisdictions to relinquishing their direct roles in providing emergency medical services in order to achieve countywide improvements in cost-effectiveness and service levels
- The unpredictable events that may occur between now and 1980 which could substantially impact the viability of one or more of the alternatives

From the information available at this time, the most feasible organizational alternative would appear to be the establishment of a joint powers authority. The most feasible funding alternative would appear to be a pro-rata sharing of costs by each of the jurisdictions in the County. However, the final selections of both an organizational and funding alternative would be a major objective of the planning process required for the successful implementation of a uniform, countywide system.

Organizational Features

Regardless of the overall organization of the uniform countywide system, the underlying operational functions of the organization should be largely the same. There are a number of functional activities that should be performed within the consolidated operation that are not dependent upon the overall organizational alternative chosen. Exhibit 7-A on page 7.49 through 7.51 illustrates each of the major functional areas and provides a brief description of how the areas would relate organizationally.

The organizational roles of several County agencies should remain largely unchanged except as modified by detailed recommendations contained later in this section. The Emergency Medical Care Committee should continue to act in an advisory capacity to the Board of Supervisors and the Department of Health Services on issues concerning emergency medical services. The Paramedic Commission should continue to hear appeals on policies and standards for emergency medical training and

certification. The role of the Paramedic Commission could be significantly changed, however, if the consolidated system were implemented as a department of County government. The Department of Health Services should continue to be responsible for administering and regulating programs directly involved with or relating to emergency medical services. Its Emergency Medical Systems Division should develop standards, provide training, control paramedic certification and recertification, monitor quality control, coordinate public education and provide disaster planning. Administrative functions such as data collection and purchasing, a significant portion of the field quality control function, and, depending upon funding arrangements, a majority of the administration of the Emergency Aid Program, should all be transferred to the uniform system.

Implementation Considerations

The demand, resource allocation, and cost analyses conducted as a part of this survey indicated that a uniform emergency medical services system would be cost-effective countywide by 1980. This projection was predicated upon assumptions which may not occur precisely as defined between now and 1980. There are a number of conditions which could impact the analyses, and thereby affect the timing of the implementation:

- Changes in the rate of growth of demand may increase or decrease the rate at which response units are added
- Changes in cost assumptions may alter the basic comparisons of cost-effectiveness
- Shifts in population or in demand patterns may change the number of units required to meet performance standards
- Revised performance standards may change the number or type of response units required

Combinations of these or other changes may affect the time at which the uniform countywide system becomes cost-effective. For example, if demand for services does not grow as fast as projected, the breakeven point for cost-effectiveness will move to a point further in the future. If demand grew at only 6% per year instead of the 9% projected, it would take until 1983 to reach 450,000 incidents per year. At the same time, if additions to provider response units resulted in a total of 194 units by 1980, then the uniform system would remain cost-effective in 1980, even though demand were lower than 450,000 incidents.

It is impossible to accurately predict the impact of these and other timing considerations. The conditions which may impact cost-effectiveness should be monitored. Their impact should be quantified and used as a guide to determine the timing of the implementation program.

There are also a number of policy and operating decisions which should be made between now and 1980 that could impact the design of the countywide system. The results of these decisions could differ from the assumptions underlying the projections made in the survey:

- Determination of minimum countywide response time standards
- Determination of policies regarding patient transportation to hospitals
- Application of variable staffing techniques
- Implementation of patient transport capability for primary response units which do not now have this capability
- Implementation of restrictive phone screening procedures to reduce non-emergency runs
- Redistribution of system costs between tax base support and user charges
- Utilization of private ambulance company units or engine companies as response units in low volume areas

Decisions in each of these areas should be made and could significantly impact the survey projections. For example, if the response time standards specified in the State Plan were adopted, only 115 response units on the average would be required in a uniform system to service 1980 demand. As these decisions and others similar to them are made during the implementation process, their impact on the projections should be determined.

There are also a number of implementation considerations which relate to the conversion from multiple providers to a consolidated system:

- Management of the transfer of responsibility from firemen to full-time EMS personnel
 - . Proper treatment of personnel who are made "excess" by the removal of EMS activity from fire departments, but who do not

want to join the new organization

- . Transferability of pension programs, seniority, and insurance coverage for those fire personnel who do transfer
- . Impact of existing union agreements
- . Identification of the best strategy for centralized call receipt and dispatch including assessment of the probability of a successful countywide or regional 911 system
- . Replacement of dual-role personnel who are needed for fire services, but who may transfer to the new system
- Fair compensation for the capital assets of public and private providers who may be acquired during the conversion period
- Management of situations where a provider should be investing money to meet new standards, but is reluctant to commit additional funds prior to the implementation of the uniform system
- Proper accounting and transfer of accounts receivable from providers to the uniform system
- Restructuring of mutual and automatic aid agreements among providers and between providers and the consolidated system

These and other similar considerations are beyond the scope of this survey. Decisions regarding the proper treatment of full-time EMS fire personnel who may not want to transfer to a uniform emergency medical system cannot be addressed until the payroll and benefit packages have been specified for the new organization, and the potential reaction of existing personnel is tested. The other conversion, design, and timing considerations must all be addressed, and their impact on the uniform countywide system evaluated during implementation planning.

Implementation Planning and Coordination

A significant amount of effort will be required to implement a uniform countywide EMS system by 1980. Major policy decisions must be made regarding the overall organizational

structure, the timing of the implementation program, and the conversion activities. In addition, a major effort will be required to organize and implement the shorter-term recommendations discussed later in this section. Exhibit 7-B on page 7.52 presents the activities involved in the implementation process grouped into general categories and organized into a recommended sequence.

All of the implementation activities will take place in an environment which is changing. Continual evaluation and replanning will be required if successful implementation is to be achieved. Because changes may occur rapidly, the planning must be done in an organized manner with definite objectives and well-structured workplans and timetables. A representative planning group of experienced EMS management personnel will be needed to ensure broad participation and to provide a forum in which to consider alternatives and develop strategies.

The planning group should interact with provider agencies and other organizations involved in emergency medical services to ensure that all viewpoints are considered in the planning and implementation activities. The planning group should be composed of a cross-section of individuals including representatives from:

- The City and County Fire Departments and other primary providers
- The Department of Health Services
- The Private Ambulance Association
- The Emergency Medical Care Committee
- Independent Cities

The planning group must quickly organize the work to be done and establish priorities. One of the first activities should be to develop a list of potential tasks and a timetable for their completion. Tasks should also be assigned to subcommittees for review and expansion. The development of detailed short- and long-term workplans is necessary to guide the planning group through the implementation process and to monitor progress.

A general implementation workplan is presented as Exhibit 7-C on page 7.53. The workplan is divided into three phases:

- Phase I, initial planning
- Phase II, short-term implementation activities and evaluation

- Phase III, long-term evaluation and consolidation planning

Tasks within Phase I should be broad in scope and related to general issues rather than to specific solutions. The organization of the planning group should be a key element of Phase I. One of the first tasks in Phase I should be to expand upon the workplan in Exhibit 7-C. Once the list of tasks has been established, a "needs" list should be prepared which outlines the information necessary to make decisions or to resolve the problems associated with a given task. When the preliminary lists have been established, priorities should be set. The planning group must understand that there will be more work to do than it has resources to commit and it must efficiently allocate valuable planning resources to high priority items.

Especially important in Phase I should be the resolution of many key legal issues such as those involving transport policy or County funding of emergency medical care to indigents. Although it is probable that all of these issues will not be resolved, they should be identified and work started toward their resolution.

Phase II should be composed of several independent activities which proceed in parallel. As the legal issues are resolved or more clearly defined, additional analysis should be done regarding the organizational alternatives to be considered for the uniform, countywide system. Also, implementation can be started on many of the shorter-term recommendations.

Some of the recommendations and implementation work may require staff assistance to compile data, perform technical analyses, conduct interviews, and do general research. The EMS planning group should consider acquiring a limited number of staff personnel to augment the time and effort required of the group members and allow them to concentrate on major issues and decisions.

During Phase II, development should begin on the design of a management data system and an EMS outcome evaluation system to assist in determining performance levels. The development of data systems which reliably report EMS incident volumes and performance data is critical to the ongoing planning and evaluation process because effective planning decisions cannot be made without accurate data.

Other Phase II activities would involve implementing changes in field operations, such as:

- Variable staffing of response units
- Decreased use of engine companies

- Expansion of automatic aid agreements
- Use of transport vehicles

Phase III should be a series of ongoing review and evaluation activities preparatory to the conversion to the countywide system. The evaluation would involve the development and modification of plans which specify the details of the conversion and of the eventual organization. Activity in Phase III should be a continuous process of review of past decisions based on new information, revised priorities, and political considerations.

RECOMMENDATION

A broad-based planning group should be established to manage and control the implementation of the uniform, county-wide system and the shorter-term opportunities for improvement.

IMPLEMENTATION ROLE OF THE COUNTY OF LOS ANGELES

The County of Los Angeles currently plays a major role in the delivery of emergency medical services countywide. The Department of Health Services is responsible for administering and regulating a number of programs directly involved with or relating to emergency medical services. Its Emergency Medical Systems Division assists in the establishment of paramedic standards, reviews paramedic performance, conducts training, continuing education and certification programs, provides public educational material, and administers the Emergency Aid Program. The Emergency Medical Care Committee acts in an advisory capacity to the Department of Health Services and the Board of Supervisors on issues concerning emergency medical services. The Paramedic Commission hears appeals on policies and standards for paramedic training and certification.

The County Fire Department provides emergency medical services to the unincorporated areas of the County as well as to the thirty-nine cities which are part of the Consolidated Fire Protection Districts. The Sheriff provides emergency medical services in mountain and marine searches and rescues and assists providers in transporting patients from remote or inaccessible locations. The Department of Beaches and the Department of Parks and Recreation provide first response capability for incidents occurring within their service areas. Furthermore, County agencies participate in the review and enforcement of County ordinances pertaining to private ambulance companies.

In addition to the County, there are currently over one hundred organizations that have a role in the management and control of emergency medical services. These organizations have different degrees of involvement ranging from peripheral relationships to the provision of emergency services within a jurisdictional boundary. If a uniform countywide system is to be implemented, the EMS roles of each of these organizations will have to be analyzed and the majority of them modified. To help ensure acceptance of the changes by each of the organizations and to improve the design of the uniform system, broad participation by each of the organizations should be encouraged.

To achieve the implementation of this major and complex change by 1980, the planning, design, and implementation efforts will have to be centrally coordinated and managed. Because of the County's significant emergency medical services role, the financial and operational effects that a countywide system could have on its role, and the need for a focal point for the management and control of implementation, the County, through the Emergency Medical Care Committee, the Department of Health Services, and the County Fire Department should assume a major role in the implementation of the uniform, countywide system.

RECOMMENDATION

The County of Los Angeles should assume a major role in the planning and implementation of the uniform countywide system.

SHORTER-TERM RECOMMENDATIONS

Standards

Definition of Terms:

The large number of emergency medical service providers in the County and the lack of close coordination between them have resulted in different definitions of terms for common system elements. The State Plan contained some definitions, but many key terms such as "response time" were not precisely defined. Standard definitions of terms are essential for the adequate measurement of performance and the comparison of information between providers.

RECOMMENDATION

Standard definitions of terms should be developed and incorporated into forms, contracts and procedures relating to emergency medical services.

Operating Standards and Procedures:

Provider procedures for EMS are largely modifications of existing fire policies and are not necessarily adequate for EMS operations. Additionally, the operations of each provider differ in the standards which have been developed for:

- Responses to incidents occurring on a border with another provider
- Normal response unit complement
- Types of vehicles used
- Equipment carried on vehicles
- Transportation capability
- Backup policies
- Training of personnel
- Use of private ambulance companies
- Scope of mutual or automatic aid agreements

These differences in provider standards and procedures hamper closer coordination and cooperation between neighboring jurisdictions and limit improvement in the overall level of service.

RECOMMENDATION

The Emergency Medical Care Committee, the County Department of Health Services, and the EMS providers should work together to establish guidelines for more uniform standards and procedures for EMS activities countywide.

Development of Standards and Procedures:

State law has assigned to the County the responsibility for developing and implementing standards and procedures for emergency medical services. Because the County is also a provider of emergency services, there is a potential conflict of interest. This potential has been reduced through the participation of non-County employees on the Emergency Medical Care Committee and through a recent change in the role of the Paramedic Commission. The potential could be further reduced if formal procedures were developed and consistently applied to expand the role of interested and affected parties in the standards and procedures development process. The participation of primary providers, private ambulance companies, other governmental providers, and hospitals, among others, should be required. In addition to reducing the potential conflict of interest, the input from other parties should improve the quality of the resulting standards and procedures.

RECOMMENDATION

Formal procedures should be established that require broad participation in the standards and procedures setting process.

Response Time Standards:

Formal response time standards have not been established in the County other than an "informal" countywide maximum average response time objective of five minutes. Individual providers may have internal response time objectives, but performance is typically not measured against established criteria. The California State Plan for Emergency Medical Services establishes maximum travel times for three levels of population density. These standards convert to an overall response time countywide of approximately six minutes.

Response time standards are primary factors in determining the number of response units and the resulting costs required to provide emergency service. For example, if a six minute countywide average response time were established, the uniform countywide system would require 115 units on the average. If the current informal standard of five minutes were formally established, 160 units would be required on the average. The one minute improvement in average response time

would require approximately forty-five additional response units at an estimated additional Direct Cost of \$7.2 million.

Neither the State Plan nor the current informal standard specify the geographical area over which performance is to be measured. For example, the State Plan specifies a response time of thirty minutes or less for 95% of the responses in low density areas. The northern part of the County is a low density area on the average. Response time by the County Fire Department averages 9.3 minutes throughout the area and exceeds the requirements of the State Plan. The Gorman area, however, is over twenty air miles from the nearest response location. Average response times to the Gorman area generally exceed the State Plan specifications.

Comprehensive response time standards should be established in the County. The standards should specify average response times, the percentage of responses required within a time frame, the population densities to which they apply, the maximum geographical area over which performance can be measured, the times of day to which they apply, and the performance periods over which they are to be measured. Several factors such as medical impact and the effect on resource allocation and costs should be considered as the standards are developed. In addition, the alternative utilization of the funds required to provide incremental improvements in response times should also be considered. The investment required to reduce response time countywide by one minute might have a higher return if applied to public education to reduce notification delay or if applied to dispatching operations to reduce the delay in call processing and response unit selection.

RECOMMENDATION

Comprehensive standards specifying response performance by EMS providers should be developed and implemented countywide.

Base Station Communication and Operating Procedures:

Operating policies in the County require that definitive care be provided to a patient only under proper medical supervision. Medical supervision is accomplished through radio communication with a base station hospital. Field personnel have reported wide variations in the competency

of radio communications with base station hospitals. Some hospitals have assigned senior and experienced personnel to attend the radio. Others have assigned personnel who may have limited field, radio, and emergency room experience. The quality also varies within a given hospital by the time of day and the workload in the emergency room. Formal standards which define minimum staffing requirements and acceptable operating procedures have not been developed and enforced. The competence of hospital personnel and the radio procedures are better now than in the past, but problems still exist.

RECOMMENDATION

Formal standards which specify minimum staffing requirements and acceptable operating procedures for base station hospital communications and operations should be developed and enforced.

Operational Improvements

Supervision of Field Activities:

Emergency response units in the County are not currently supervised in the field by medically qualified personnel. Most EMS providers are fire departments, and response units are normally supervised by senior fire personnel who may not have medical training beyond FA/CPR skills. Field supervision should be a part of normal provider operations to ensure the quality of the services delivered. The supervisory positions should be filled by medically-qualified personnel with extensive field experience. A field-supervisor's duties should typically include:

- Unscheduled in-field reviews of emergency incidents
- Responses to EMS incidents which are unusual or involve another agency
- Responses to scenes when requested by field personnel to assist in unusual or problem cases

- Investigation of citizen complaints
- Reviews with the County EMS quality control personnel and hospital emergency personnel regarding quality of care

Under the current provider configuration, each of the forty providers would be required to assign field supervision. This requirement could be reduced if smaller providers agreed to employ personnel to supervise their mutual operations. In-field supervision could be implemented more cost-effectively under a unified countywide system.

RECOMMENDATION

All providers should implement field supervisory positions.

Utilization of Paramedics by Primary Providers:

Available information indicates that paramedics do make a valuable contribution to overall patient care and do improve the quality of service delivered. A detailed study conducted in Long Beach concluded that lives were saved in the field through the administration of CPR techniques and the reduction of the effects of shock and other "life-threatening" complications. A more recent study conducted for the Department of Health Services to evaluate the effects of the paramedic program in the County concluded that paramedics and paramedic activities do result in additional lives saved and that emergency room personnel working with paramedics are generally satisfied with their performance.

Other than the results of these studies, there is currently little information available regarding patient outcomes as a result of paramedic services. Operating statistics indicate, however, that paramedics provide definitive care in the field under supervision of a base station hospital for over 30% of the incidents to which they respond. If it were assumed that paramedics were only required on those incidents where definitive care was rendered, a less costly resource such as an EMT I might be dispatched to the majority of the incidents. This two-tiered response pattern, however, would be difficult to implement. It would require definitive phone screening

techniques and present difficult logistical problems. For example, because of the size of the County, if only 30% of the response units countywide were paramedic-equipped, response times to incidents which were assumed to require definitive care would be significantly longer than they are currently.

Over 80% of the units in the County are currently paramedic-equipped. Many primary providers in the County are converting the remaining EMT I-equipped response units to paramedic units. Because of the apparent benefit of paramedics and the logistical difficulty of a two-tiered response, the conversion of EMT I units to paramedic units should continue.

RECOMMENDATION

All primary response units in the County should be staffed with paramedics and equipped with standard paramedic-related equipment and supplies.

Flexible Response Patterns:

The County has a wide variety of terrain, including mountains, desert, flatlands, beaches, forests and farmland. The populated areas are primarily medium density housing, but large parts of the County are high density urban areas. The majority of the area consists of low density mountain and desert regions, which may have significant weekend and seasonal recreation usage. In addition, the demand for service varies throughout the County by time of the day, by day of the week, and by season of the year. Each of these factors impacts the operating characteristics of emergency medical services. A system in a low density mountainous area has different operating requirements than a system in a high density urban area.

Emergency providers in the County who service homogeneous areas with relatively static demand have uniform operating requirements and can employ standard response patterns throughout their service areas. Large providers which service areas with a wide variety of geographical, population, and demand characteristics do not have uniform operating requirements. These large providers, however, typically utilize

uniform response patterns throughout their service areas. The response patterns should change to fit the operating requirements. For example, response unit locations should change to respond to shifts in demand as a result of weekend and seasonal recreation. Contracts should be negotiated with private ambulance companies to provide backup to units serving large geographical areas. Fire engines with private ambulance companies should be used to provide paramedic service in areas where the demand does not justify the use of a full-time emergency unit.

RECOMMENDATION

Providers should develop flexible response patterns to fit local operating requirements in their service areas.

Mutual And Automatic Aid:

Most of the independent cities in the County have mutual aid pacts with neighboring cities or the County which provide for backup fire department manpower and equipment when needed. Mutual aid pacts are fire-oriented and typically do not apply to emergency medical services. EMS providers who receive calls for service outside of their jurisdictional boundaries may refer them to the responsible provider even if the transfer process results in significant response delays and even if their own unit is closer to the scene. Providers who receive calls for services within their jurisdictional boundaries routinely will not respond to an incident until one of their units is available even if a neighboring provider has an available unit that could quickly respond to the scene.

Agreements should be developed between neighboring providers to routinely respond to requests for service along jurisdictional boundaries and to provide backup response capability. These agreements would reduce potentially life-threatening delays and could significantly improve service levels. Such agreements could also significantly reduce mutual operating costs by reducing the number of units required to service a given area. Reimbursement procedures could be developed between providers or the interjurisdictional services could be assumed to break even.

There are potential political problems with this recommendation particularly between jurisdictions that do not provide equal service levels. The potential improvements in service levels or reductions in mutual operating costs should act as an incentive for neighboring providers to resolve conflicts that may arise. Several providers in the County such as Downey, El Segundo, Hawthorne, Manhattan Beach, Montebello, Redondo Beach, and Santa Fe Springs have already implemented similar agreements.

RECOMMENDATION

Each EMS provider in the County should implement agreements with neighboring EMS providers to routinely respond to requests for service along jurisdictional boundaries and to provide backup response capability.

Variable Staffing:

The demand for emergency medical services is not uniform throughout the day. The highest demand typically occurs from 4:00 P.M. to midnight and the lowest demand from 2:00 A.M. to 9:00 A.M. On an average day, requests for emergency services may be as much as seven times greater for peak hours than for the lowest demand hours.

In urban regions where service areas are geographically small, fewer units are required to maintain a minimum response time at low demand hours than are required at peak hours. The prevalent provider staffing pattern in the County is the standard twenty-four hour fire department shift. Those providers utilizing this pattern that staff for peak demand have unused capacity for the majority of the day. Those providers that staff for average demand provide lower service levels during peak demand hours and have unused capacity during the hours of lowest demand.

In 1980, if variable staffing were implemented with twenty-five units which operated twelve hours per day, there could be a reduction of up to 8% in total Direct Costs. If these units were staffed with personnel who were paid straight-time overtime and who did not have incremental benefit costs, the savings could be as much as 12%. The variable staffing tech-

nique could result in 1980 savings of up to \$2.6 million in Direct Cost. Variable staffing could be implemented currently by the primary urban providers, such as the Los Angeles City Fire Department, with significant savings.

RECOMMENDATION

To improve cost-effectiveness and at the same time achieve an adequate service level throughout the day, providers should implement variable staffing where it is feasible.

Screening of Requests for Emergency Medical Services:

Many of the EMS providers in the County are currently screening requests for emergency assistance. The screening procedures and the utilization of resulting information are not consistent throughout the County. In addition, there are no formal procedures for evaluating the adequacy of the current procedures or the information obtained. Screening procedures are required to facilitate the selective dispatch of response vehicles, to reduce system abuse, and to improve the quantity and quality of information relayed to the response units.

Alternative screening procedures should be tested by evaluating incident outcomes under each alternative. Procedures can be tested at no risk to the individual patient by conducting the evaluations in parallel with existing dispatch operations. The results of the parallel evaluation can be used to determine the optimum screening procedures, to measure their degree of application, to measure the risk associated with their application, and to compare their performance against existing screening and dispatching techniques.

RECOMMENDATION

Procedures for the screening of requests for emergency medical services should be developed, tested in parallel and implemented county-wide.

Dispatching of Engine Companies:

Sixteen independent cities and the County Fire Department dispatch engine companies to all EMS incidents as a normal operating policy. Although additional manpower may be required at the scene due to the nature of the emergency, the major justification for the policy is to improve response time. As was shown in Section 3, depending upon the area, the engine companies may not actually improve response time. In the Los Angeles Dispatch Area, which accounts for 65% of the County Fire Department EMS incidents, the engine response performance was not significantly better than the emergency squad performance.

The other twenty-three primary providers, which accounted for 67% of all runs made in 1975, dispatch engine companies only when they are thought to be needed for assistance, when the engine company is significantly closer to the incident, or if the primary EMS unit is busy. If it is subsequently determined that additional manpower is required at the scene, the engine is dispatched on a call back basis. This policy results in a decrease in the use of engine companies of from 60% to 65%.

Changing the policy in the County Fire Department and other similar providers would decrease the costs of operation. The impact of reducing engine company usage using 1975 costs and volumes is shown below in Table A. The exact amount of the cost savings would depend upon geography, and primary response vehicle utilization. The 30% and 50% examples shown are the probable lower and upper bounds for the cost savings. More importantly, perhaps, as much as 80,000 fire department man-hours could be freed for a more productive use.

TABLE A
1975 NET COST IMPACT OF
REDUCING ENGINE COMPANY USAGE
(\$000's Omitted)

	<u>Percent Reduction in Use</u>	
	<u>30%</u>	<u>50%</u>
Direct	\$147	\$245
Allocated	\$824	\$1,374
Modified Fully Absorbed	\$1,216	\$2,028

RECOMMENDATION

Provider procedures should be changed to limit the dispatch of engine companies to those incidents where they can respond significantly faster than the primary response unit, or where additional manpower is needed at the scene.

Dispatch of Private Ambulance Companies:

The current process for dispatching a private ambulance company to provide patient transportation capability for the County Fire Department results in significant delays in response time. If transportation is required the Fire Department dispatcher contacts the Sheriff's Central Communication Center which transcribes the necessary information and calls the appropriate Sheriff's substation. The substation personnel transcribe the required information and call the appropriate private ambulance company. The ambulance company again transcribes the information and dispatches an ambulance unit.

A study conducted to determine the time required to complete the dispatch process indicated that the delay averaged 3.1 minutes and ranged from two minutes to ten minutes. If the County Fire Department were able to contact the ambulance companies directly, the average time required to provide transportation to the scene could be reduced by three minutes.

The existing private ambulance company request procedure using the Sheriff's Central Communications Center should be eliminated. The County Fire Department should implement a system of direct lines between the Fire Department dispatching centers and the seventeen private ambulance companies used by the County. The Sheriff's substations should retain their phone lines to the ambulance companies to enable the Sheriff to request an ambulance for such purposes as custody transports.

RECOMMENDATION

The County Fire Department should implement the capability to contact private ambulance companies directly.

Base Station Communications Systems:

Significant technical and operational problems exist in telemetry communications between response units and base stations. For example, telemetry and voice signals from response units communicating with hospitals using the same radio channel may at times interfere with one another. Because the same frequencies are used in other areas, interference may occur between base station hospitals in Los Angeles County and in Orange County. Also dead spots occur in the existing telemetry radio coverage which hamper the communications between base stations and response units.

The County has contracted with an outside consultant to develop a design for a new communications system. Based upon available information, the design of the system appears sound and should eliminate many of the current problems. However, implementation of the design will require a considerable investment by the County and the EMS providers.

RECOMMENDATION

The new base station communications system design should be finalized and implemented.

Patient Transport to the Closest Qualified Facility:

Emergency medical providers in the County have different policies regarding patient transportation to hospital facilities. For example, some providers transport to the closest available facility and some transport to the nearest EAP facility. The closest available facility may not be the most qualified to service a particular medical incident. The nearest EAP hospital may not be the closest qualified facility. Each of these policies may result in less than optimum patient care and increase the legal liability of the providers.

In addition, providers may be requested by a patient or a patient's family to transport to a hospital which may not be the closest qualified facility. Such transports may jeopardize the life of a critical patient and may take the response unit out of its normal area and require it to be unavailable for an extended period of time.

RECOMMENDATION

A uniform, countywide policy should be developed for transport to the closest, qualified emergency facility.

Use of Helicopters:

The County Fire Department and the Sheriff each use helicopters as part of their EMS operations. Both departments make about the same number of runs each year, 500 to 600, and the volume is increasing. Problems currently exist in coordinating the use of helicopter units between the two agencies. Between the two agencies there are only five helicopter units and proper coordination would be relatively easy to implement. Operating policies and procedures should be developed for each agency to inform the other of their unit locations and to coordinate the use of the resources more effectively.

RECOMMENDATION

Procedures should be developed for coordinating the use of County helicopters for emergency medical services.

Administrative Improvements

Certification and Control of Providers:

There is currently little effective control over the operations of individual emergency medical services providers. The County has assigned the responsibility for provider regulation to the Department of Health Services. As Exhibit 7-D on page 7.54 illustrates, the County's control is exercised through the Emergency Medical Systems Division. However, existing management and control over operating practices is limited to paramedic certification procedures and the specification of standard equipment lists for paramedic vehicles. As Exhibit 7-E on page 7.55 shows, these practices actually result in control and regulation of only paramedics and not of the providers themselves.

Direct control over provider operating procedures is necessary to effect systemwide standardization and coordination of provider operations. Without such standardization it is difficult to ensure a minimum quality of care throughout the County.

Mechanisms should be developed to implement detailed policies and procedures for treatment, transport, communications and provider interface. The mechanisms should also include an appeals procedure, a procedure for providing alternative service if a provider is decertified, and a method for charging the decertified provider for this alternative service. New legislation or amendments may be necessary to empower the the County to implement this recommendation.

RECOMMENDATION

The County Department of Health Services should develop and implement procedures to certify, decertify, and recertify providers as part of an overall provider regulation program.

EMS Personnel Certification:

Although the Department of Health Services EMS Division is responsible for the control of paramedic certification, formal procedures have been established only for initial certification. Certification responsibility implies not only the ability to certify, but also the ability to recertify and decertify. Formal procedures should be developed for recertification and decertification and the scope should be expanded to include EMT I personnel as well as paramedics.

RECOMMENDATION

Procedures should be developed and implemented for the certification, recertification, and decertification of paramedic and EMT I personnel.

Regulation of EMT I Personnel:

The Department of Health Services, the Emergency Medical Care Committee, and the Paramedic Commission should include the 1,300 EMT I's and the 179 EMT I-level response units within the scope of their respective roles. EMT I's are a major EMS resource throughout the County, and in many parts of the County, EMT I's provide the only EMS coverage. Their activities should be controlled and supervised, and their role and procedures as well defined as paramedics.

RECOMMENDATION

The management and control of emergency medical services should be expanded to include EMT I-level personnel.

Private Ambulance Company Rates:

The County of Los Angeles, through the Emergency Aid Program, establishes the rates charged by private ambulance companies in unincorporated areas of the County. Though not legally required to do so, private ambulance companies usually charge the EAP rates in the incorporated areas of the County as well.

The County does not have a formal, rigorous process for establishing ambulance company rates, nor does it have formal, maximum-profitability guidelines. The County normally enacts the rates established by the City of Los Angeles Board of Public Utilities and Transportation. The principal criterion used by the City Board in establishing rates is that ambulance company profits should not exceed 8% of revenue after taxes. However, the City Board evaluates ambulance company cost data infrequently, the number of companies evaluated has historically been limited and the data submitted by the companies is not typically audited. This process results in ambulance company rates utilized throughout most of the County that do not necessarily reflect industry costs.

RECOMMENDATION

The County should develop a formal and rigorous rate-setting procedure so that ambulance company rates consider industry costs and profitability guidelines. Costs should be determined through a periodic examination of selectively audited financial data from a representative number of companies.

Determination of the Closest Qualified Emergency Facility:

Adequate criteria do not exist for determining which hospital in a given area is the most appropriate facility for a specific type of incident. Information should be available to response units and provider management describing hospital capabilities:

- Primary and secondary emergency facilities by response area
- Types of emergency cases handled by each facility
- Staff available
- Specialty cases taken
- Hours of operation
- Patient intake capacity

This data should be obtained through a detailed and an on-going categorization process which is linked to EAP and base station hospital certification.

RECOMMENDATION

A hospital categorization study should be conducted by the Department of Health Services to assess the capabilities of facilities; a procedure for data collection should be established to assist in updating the information and for use in contract renewal.

EMS Incident Form:

Each of the public and private providers completes one or more forms to document an EMS incident. Some providers utilize a single fire reporting form; others utilize as many as five separate forms each overlapping the others to some extent.

None of the forms that are currently being used is comprehensive enough to adequately document an emergency incident for medical, management information and billing purposes. In addition, the information required on the forms is not consistently or reliably recorded. The forms used also vary in the type of information required and the definitions of terms used.

The Emergency Medical Systems Division has issued a standard form for documenting paramedic activities. The form does not

require enough information for adequate documentation, and it is typically completed only for paramedic incidents, although exact provider usage varies. This form should be redesigned as part of an overall information system design. Additionally, by capturing data useful for billing purposes, the form can be used to replace the present EAP ticket. Exhibit 7-F on page 7.56 presents an example of one possible form.

RECOMMENDATION

A comprehensive countywide reporting form should be developed to replace existing forms currently in use, and its use should be required by all providers and for all emergency medical incidents.

Management and Statistical Information:

There is currently little management or statistical information being developed on an ongoing basis to describe the resource inventory, activity, and performance levels of emergency medical services in the County. Much of the data gathered for the first time in this survey should be gathered and reported on a continuous basis.

System inventory information should be developed at least semi-annually from questionnaires distributed to and completed by each provider in the County. The inventory should include personnel by training level, units by type, area served, response patterns, communication capabilities, and response unit locations.

Operating reports describing activity and performance levels should be generated from the EMS incident form and dispatch ticket, reviewed centrally, and shared with the individual providers. The dispatch ticket provides a control to ensure that all EMS incident reports are completed and provides additional information, such as the time intervals between key events. Information which should be gathered and reported includes:

- Incident Volume
 - . By medical type
 - . By provider
 - . By area
 - . By unit

- Response Time
 - . By provider
 - . By area
 - . By unit
- Time Frequency of Demand
 - . By provider
 - . By area
 - .. By time of the day
 - .. By day of the week
 - .. By season of the year
- Service Time
 - . By provider
 - . By area
 - . By unit

The frequency of reporting should vary with the type of information. Response times should be reported at least quarterly and compared to previous data. Time frequency of demand, which would be used primarily to optimize staffing levels and response locations, might be reported semi-annually.

A data base should be developed from the information on the inventory questionnaire and on the EMS incident form and dispatch ticket. The data should be maintained in a machine-processible format for special purpose reports and to facilitate more sophisticated utilization of the data in the future. For example, exception reports could be developed to highlight incidents by area which had longer than a ten minute response time. Reports could be developed to determine whether individual personnel were responding to a sufficient number of specific types of incidents to maintain their proficiency. The information could also be utilized to mail educational material to heart attack victims or to encourage them to enroll their families in CPR training programs. The data could also be used as feedback to help shape training, continuing education, and public education activities.

The Emergency Medical Systems Division of the Department of Health Services is currently designing a reporting system based on a revised MICU form. The system they are contemplating would apply only to paramedic responses and is limited in its proposed scope. Such design activity should be halted until a more comprehensive requirements study has been completed.

RECOMMENDATION

A comprehensive reporting system should be developed to provide management and statistical information describing the resource inventory, activity and performance levels of emergency medical services countywide.

Public Education:

EMS public educational activity in the County involves several areas:

- Emergency capabilities and resources
- System access methods
- Emergency prevention
- Critical or emergent conditions
- Proper system usage

Several agencies and associations are involved in the public education process:

- Emergency Medical Systems Division of the County Department of Health Services
- Hospital Council of Southern California
- American Red Cross
- American Heart Association
- Emergency providers, including the Los Angeles City and County Fire Departments

While the number of participating agencies is high, the level of coordination to ensure the proper coverage, the proper allocation of educational resources, the proper thrust of the educational effort, and to determine the requirements for additional programs is currently low. There is no organizational entity in the County which is responsible for coordinating educational efforts, nor is there an agency which monitors programs to determine the overall level of effort, the effectiveness, or the adequacy of coverage by educational topic and for each area of the County.

RECOMMENDATION

The agencies and associations involved in public education should establish an ad hoc committee to develop policies and procedures for coordinating and maximizing the effect of public educational resources countywide.

Public Training:

The Emergency Medical Systems Division of the Department of Health Services is implementing a program similar to the programs now in existence in Seattle and other cities, to train people in CPR techniques. The effect of the program will be difficult to measure, but there is data that indicates that lives can be saved by civilians who have been taught the techniques. The EMS Division is utilizing fire department personnel to conduct this training. The stated objective of the effort is to eventually train 20% of the population. The training effort has not been directed at specific segments of the population, but has been made generally available.

RECOMMENDATION

To maximize the effect of limited training resources, CPR training should be coordinated with public educational programs and directed toward high risk populations and to those areas where alternative emergency resources are not readily available.

Control of Quality

Maintenance of Field Personnel Proficiency:

Once EMS personnel receive their paramedic certification, reinforcement of skills and maintenance of proficiency in complex procedures becomes dependent upon the volume of activity of the response unit to which they are assigned. For example, starting an IV is a skill which improves with the number of times an individual performs the task. Proficiency in such tasks is more easily maintained in a unit making a large number of responses than in one making only a few, because the likelihood of having an incident requiring an IV is much greater.

RECOMMENDATION

Providers should establish policies to maintain field personnel proficiency by rotation of personnel between low and high volume response units.

RECOMMENDATION

County training and certification personnel should monitor the incident volume and the types of skills used by paramedic and EMT I personnel for use in recertification and training programs.

Field Quality Control Reviews:

The Emergency Medical Systems Division of the Department of Health Services is responsible for reviewing the capability of paramedic personnel and the quality of care provided in the field. Regional Paramedic Coordinators visit response units periodically and ride along on actual incidents. The regional coordinators also attend meetings at base station hospitals to discuss emergency performance and operating policies and procedures.

Currently the coordinators may not be field-experienced and follow informal workplans which emphasize those areas that they individually feel are important. The review process should be structured and formalized to ensure a uniform and thorough review throughout the County. The results of the reviews should be formally communicated to each provider. The results should also be summarized and used as input to the training, certification, recertification, and decertification programs.

RECOMMENDATION

Formal and uniform quality control review procedures should be established.

Quality Control Reviews of Larger Providers:

The regional paramedic coordinators of the Emergency Medical Systems Division review the performance of each paramedic approximately every three to six months. Because of the critical nature of paramedic performance, the review frequency should be increased. In an effort to increase the frequency, larger providers should be encouraged to implement their own quality review procedures. Countywide standards could be developed to establish acceptable provider review procedures and frequencies. The Emergency Medical Systems Division could then audit the provider procedures rather than review the performance of individual paramedics. This process would enable the coordinators to increase the frequency of their reviews of paramedic performance in smaller providers.

RECOMMENDATION

Larger providers should be encouraged to implement their own internal quality control reviews.

City of Los Angeles Quality Control Reviews:

The Emergency Medical Systems Division is responsible for quality control reviews of all paramedic personnel. Because of the critical nature of emergency medical services, the quality of the performance of provider personnel should be reviewed and evaluated. The Fire Department of the City of Los Angeles and the Emergency Medical Systems Division have not developed mutually acceptable review procedures

RECOMMENDATION

The Los Angeles City Fire Department and the Emergency Medical Systems Division should develop mutually acceptable procedures for reviewing the quality of field performance in the City of Los Angeles.

EMT I Performance Reviews:

The regional paramedic coordinators of the Emergency Medical Systems Division only review the performance of paramedics. The quality of the performance of the 1300 EMT I's in the County, who also provide medical services in the field, is not being reviewed by an independent agency. The quality of their performance is monitored only by quality control procedures that may have been established by individual providers.

RECOMMENDATION

Criteria and formal procedures should be developed for reviewing the quality of the performance of EMT I personnel.

Emergency Aid Program

Emergency Aid Program Payments and Billing:

Under the Emergency Aid Program ("EAP") the County pays private ambulance companies for transports and dry runs in unincorporated areas of the County and in cities contracting for emergency services with the County. In order for the County to make payments, charges must have been properly authorized and uncollectible by the ambulance companies. Ambulance companies submit invoices to the County, substantiated by EAP ticket copies. These invoices are paid, then checked against activity logs submitted by public agencies empowered to authorize patient transport. Corrections and adjustments for errors are reflected in subsequent payments. The cities contracting with the County are billed for uncollectible charges for transports within their boundaries.

Reimbursement for dry runs results in a reluctance by providers requiring transportation to simultaneously dispatch private ambulances. Ambulances are frequently requested from the scene, after it has been determined that transportation is required, in order to reduce dry run costs. This practice can result in life-threatening delays. In addition, the current billing and payment procedures are extremely complex, costly, and time-consuming. Six County administrative organizations are involved, plus each of the authorizing agency locations. Large volumes of forms are generated and processed to control billing and payments. In spite of the complexity of the procedures, controls, such as those over duplicate payments, are currently inadequate.

These problems should be resolved through a change in billing and payment procedures. Payments to ambulance companies should be at a flat monthly rate based on cost, plus a fixed fee, computed and adjusted periodically. The amount should reflect average costs and historical collection rates, as well as individual company volumes. Ambulance company financial and volume data should be audited annually and verified by spot checks against transport and dry run information which should be kept by the County. Uncollectible accounts should continue to be forwarded by the ambulance companies to the County for collection. Contract cities should be billed for their portion of the uncollectible accounts.

RECOMMENDATION

Private ambulance company reimbursement under the Emergency Aid Program should be changed to a flat monthly rate with periodic adjustments.

EAP Contract Changes:

Three types of contracts are utilized in the Emergency Aid Program to provide pre-hospital transports and hospital admissions. The "ambulance company contract" between private ambulance companies and the County provides for ambulance services in unincorporated areas and in cities designated by the County. Designated cities enter into a "standard city contract" with the County which allows them to receive the ambulance services for which the County has contracted. Some cities providing their own patient transport have "special city contracts" which allow them to write EAP tickets used for hospital admissions.

Although the three contracts are part of a unified contractual structure, they are often inconsistent in terminology. In addition to containing inconsistent language, the contracts do not clearly specify the County's right to financial and operational audits of private ambulance companies. This right to audit should be clearly stated and should be broad enough to allow the County to properly regulate ambulance company operations and monitor their costs under the Emergency Aid Program.

RECOMMENDATION

Emergency Aid Program contracts should be reviewed to remove inconsistent language and to add provisions clarifying and broadening the scope of the County's financial and operational audit right.

EAP Authorizing Agencies:

In order for an ambulance company or a hospital to be reimbursed by the County for uncollectible transport or hospitalization charges, an EAP ticket must be issued by an authorized agency. This is done to enable the County to control the payment process. Law enforcement agencies, such as the Sheriff, typically perform the authorization function.

Approximately 100,000 tickets are currently being issued annually. About 75,000 will be issued by law enforcement agencies, including 35,000 by the Sheriff. The remaining 25,000 tickets will be issued by primary EMS providers. Law enforcement personnel are required at the scene approximately 20% of the time for traffic control or other law enforcement duties.

If the primary EMS providers in the County were given the responsibility for EAP authorization, law enforcement agencies could reduce their responses to emergency medical incidents by an estimated 80%. This would not materially reduce the control over the payment process. In addition, up to 20,000 hours of law enforcement effort could be devoted to more productive law enforcement activities.

RECOMMENDATION

Law enforcement agencies should be replaced by primary EMS providers as the agencies responsible for EAP authorization.

EAP Tickets:

The EAP ticket is currently used to authorize both pre-hospital transports and emergency admissions to hospitals in the County. Approximately 100,000 of these tickets are issued annually. The only information on the ticket that is necessary for EAP purposes is a control number and an

authorizing signature. This information could easily be captured on an EMS incident form. If the EAP ticket were replaced by the incident form, over 100,000 three-part forms could be eliminated from the current paperflow.

RECOMMENDATION

The EAP ticket should be eliminated by incorporating the information needed for EAP purposes onto a uniform, countywide incident form.

Discounts on Late EAP Payments:

Under the provisions of the Emergency Aid Program, the County pays private ambulance companies for transports in unincorporated areas of the County if the companies cannot collect from the patients. About 30% of these patients fail to pay their bills from the ambulance companies. The County pays the ambulance companies for these patients and attempts itself to collect from them.

The County's contract with the ambulance companies requires that patients be billed at the rate set forth in County Ordinance 5860. The companies are reimbursed by the County at a lower rate established by the ordinance. The County then bills the patients at the same rate at which the County paid the ambulance companies, rather than at the rate at which the patients were originally charged. Although the County's \$7.77 collection charge may offset the rate differential, these procedures frequently result in discounts to late-paying patients.

RECOMMENDATION

Late-paying patients in unincorporated areas should be billed by the County at the same rate at which they were charged by the ambulance companies. An additional collection charge should be added to offset collection costs.

Hospital Reimbursement:

A major portion of the cost of the Emergency Aid Program consists of payments to contract hospitals for emergency room and inpatient services to EAP-eligible patients. In 1975 the County paid over \$3,100,000 to hospitals, which included \$1,300,000 for inpatient charges and \$1,800,000 for emergency room charges.

Contract hospitals are typically reimbursed at full rates for both inpatient and outpatient services. These rates are generally significantly higher than their costs of providing services. The County could achieve significant savings if the hospitals were reimbursed at rates closer to their costs, such as Medi-Cal inpatient cost settlement rates and Medi-Cal outpatient Schedule of Maximum Reimbursement rates. Exhibit 7-G on page 7.57 shows that the application of these rates could have saved the County approximately \$520,000 in 1975.

RECOMMENDATION

To realize a potential savings of approximately \$500,000 per year, a mechanism should be established to reimburse hospitals for emergency and inpatient services to EAP-eligible patients at rates more comparable to the cost of providing the services.

Hospital Charges for Medi-Cal Eligible Patients:

The County is billed by contract hospitals for emergency and inpatient services rendered to EAP-eligible patients. Payments for the services are currently considered a general obligation of the County as part of payments made by Outside Medical Relief. Subsequent to these services, many patients are enrolled in Medi-Cal as inpatients at County hospitals. Emergency services for patients are covered by Medi-Cal retroactively for ninety days prior to enrollment. The charges incurred at contract hospitals for these newly enrolled patients should be billed to Medi-Cal. Retroactive billing could be accomplished in either of two ways. The contract hospital could be requested to bill Medi-Cal under its own provider number for those patients subsequently enrolled. The hospital charges could also be billed to Medi-Cal by the County and included in the cost base for Medi-Cal reimbursement of County hospital costs. Exhibit 7-H on

page 7.58 shows that the implementation of retroactive billing could have saved the County over \$1,000,000 in 1975.

RECOMMENDATION

To realize a potential savings of approximately \$1,000,000 per year, procedures should be implemented to bill Medi-Cal for EAP hospital charges for emergency patients subsequently enrolled in Medi-Cal.

Interfacility Transport and Patient Overflow Program

The Interfacility Transport Program provides indigent patients with nonemergency transport from private hospitals to County hospitals, from County facilities to nursing homes, from County facilities to State mental hospitals, from patients' homes to County clinics and hospitals, and between County hospitals and clinics.

The County operates 130 vehicles including forty-six fully-equipped EMT I Ambulances to provide interfacility transportation. Because the patient load can exceed the available County resources, private ambulance companies are used to transport patients under "Overflow" contracts. When the patient's condition requires it, the private ambulance may be staffed with paramedics or a registered nurse.

The County vehicles often transport multiple patients because of the volume of patients requiring transport and because of an attempt to reduce the cost per patient transported. This practice frequently results in cramped and uncomfortable conditions and the mixing of ambulatory and stretcher patients.

The administration of the program is decentralized among the seven County hospital facilities, and there is little coordination of the program between the facilities. There was little reliable financial or statistical data available to describe the program operation. For example, accurate counts or reliable estimates of the patient transport volume did not exist for six of the County facilities.

From the data that could be developed regarding the program, primarily from the records at the USC Medical Center, estimates were made of the costs of county vehicle and private ambulance transports:

- The private ambulance companies' share of patients transported ranged from 6%

at Martin Luther King Hospital to 27%
at USC Medical Center.

- The estimated cost per trip for a County vehicle at USC Medical Center was \$58.55, and the cost per patient transported was \$25.54. The lower per-patient cost was achieved through multiple patient transports per trip.
- The estimated cost per patient carried by private ambulances at USC Medical Center was \$28.89. This cost was higher because the privates have a higher incidence of single patient transports, although they also may carry multiple patient loads.

Based upon these estimates, the costs of County vehicle and private ambulance transport are similar. Many of the private ambulance companies currently have excess vehicle transport capacity. It may be possible, through cost-based reimbursement and improved scheduling and ambulance loading, that the private companies could reduce their cost per run significantly. This might enable the County to improve the quality of the service and at the same time reduce the cost of patient transportation.

RECOMMENDATION

A comprehensive operational audit should be conducted to determine the volume and actual costs of the current program.

RECOMMENDATION

Minimum acceptable patient transportation service levels should be defined and their impact, if any, on the cost of the program should be determined.

RECOMMENDATION

The County should obtain bids from ambulance companies to determine the cost if the program were performed by a private contractor.

Patient Transportation by County Fire Department

Introduction:

The County Fire Department's rescue squads do not have transport capability and private ambulance companies are used to provide patient transportation. This occurs on approximately 60% of the EMS incidents responded to by the County Fire Department. If County paramedics have begun definitive care, they will accompany the private ambulance to the hospital. To implement patient transport, the County Fire Department would have to convert from its current squad trucks to van-type vehicles and change its current method of operation.

There are two primary reasons for implementing transport capability. First, the ability to transport could reduce potentially life-threatening delays, if a private ambulance is not immediately available. Second, significant cost savings and revenue offsets would accrue to the County if patients were billed for transportation.

Vehicle Cost Impact:

Squad units and vans have approximately the same useful life, but different depreciation costs because purchase prices differ. Currently, the County Fire annual vehicle depreciation cost is approximately \$1,689 per active squad or \$52,000 overall. If the squad vehicles were replaced by transport van units, the annual total depreciation expense would increase to \$113,000. The net increase in cost would be approximately \$61,000 per year.

Operating data from existing EMS operations indicates that ambulance vehicles are more expensive than squads to maintain, but that costs for gas and oil are about the same. Maintenance for County squads averages \$1,744 per vehicle, while rescue ambulances average about \$2,400 per year. For the units now in service plus spare vehicles, the increase in annual maintenance cost would be approximately \$25,000. Additional mileage on the vehicles would probably add 25% to the direct operating expense, or approximately \$20,000 per year.

Other costs which are not now a part of the County operation, such as expenses for linens, oxygen, and disposable supplies would also be incurred. Countywide experience indicates that an additional cost of \$500 per vehicle per year is reasonable. This would be approximately \$15,000 annually for all squads. The total annual cost increase for converting to transport units would be:

Depreciation	\$61,000
Maintenance	\$25,000
Operating Expense	\$20,000
Miscellaneous Expense	<u>\$15,500</u>
TOTAL	\$121,500

Charges for Service:

If a fee for transportation service were implemented and billed by the County, additional revenue would be generated. Two factors would influence the amount of revenue: the fees charged and the collection rate. Private ambulance companies operating in the County collect from approximately 70% of the patients they bill at an average charge per transport of \$50.15. The City of Los Angeles, however, currently collects approximately 54% of the amount they bill and their charges are \$35 plus \$5.00 for night service. If it were assumed that the County Fire Department would charge an average of \$40.00 per transport and collect from 55% of the patients, up to \$760,000 in revenue could be generated.

EAP Savings:

An estimated \$750,000 in EAP payments are made annually for transports originating through the County Fire Department. If the County were to perform all transports, the EAP payments would no longer be required. An estimate was not made for savings in program administration because the staff required for patient billing would more than offset the reductions in EAP-related personnel. In addition, annual costs of \$100,000 have been included in the total cost impact to reflect the additional effort that would be required for billing and collection activities.

Added Workload:

Presently County squads accompany private ambulances to the hospital when the squad paramedics have begun definitive care, which occurs on approximately 40% of all incidents resulting in transports. Transport time in these instances is approximately fifteen minutes. Consequently, for each transport performed by the County Fire Department in addition

to the number of transports now accompanied by the squads, an additional fifteen minutes would be added to the squads' workload. Also an estimated five minutes per run would be required to change linens and replace materials, such as oxygen, used during the transport. The County squads do not perform these tasks presently, so this five minute increment would be added to the time required for all transports made by the County.

If the County performed all of the transports currently required, the estimated incremental workload would be about 16,000 man-hours. The County Fire Department squads now spend an estimated 102,000 man-hours on EMS activity, out of a total of approximately 815,000 productive man-hours available. The additional workload would result in 118,000 total productive EMS man-hours, increasing the time spent on EMS field activity by only about 2%.

The increased workload resulting from transports should not cause a need for additional squad manpower on the average. Therefore, the County Fire Department Direct Cost would not change except for increased vehicle expense. However, because support and overhead costs were allocated based upon personnel time, the increased workload would cause Allocated and Modified Fully Absorbed Costs to increase.

Cost Impact Summary:

Exhibit 7-I on page 7.59 shows that the net Direct Cost savings of transportation by the County Fire Department would range from an estimated \$580,000 at low volume to an estimated \$1,280,000 at high volume. The low volume estimate would occur if the County Fire Department transported on these runs where it now follows the private ambulance to the hospital. The high volume estimate would occur if all transports were performed by the County Fire Department. The net Direct Cost savings includes EAP savings, not only for the unincorporated areas, but also for the cities who contract with the County for fire and EMS services as part of the Consolidated Fire Protection Districts. These cities reimburse the County for EAP charges and therefore from \$120,000 (at low volume) to \$300,000 (at high volume) of the cost savings may actually accrue to these cities and not to the County.

Conclusion:

The Direct Cost savings and the reduction in potentially life-threatening delays indicate that a transport capability should

be implemented in the County Fire Department. In order to effect successful implementation, the County would have to develop a capable billing and collection system. In addition, a one-time capital investment of approximately \$600,000 would be required for conversion to transport capability. The investment could be reduced to approximately \$300,000, the aggregate difference in purchase price between squads and vans, and could be spread over time, if the conversion were made in conjunction with the normal vehicle replacement schedule.

Before implementing patient transportation capability, other factors should be considered:

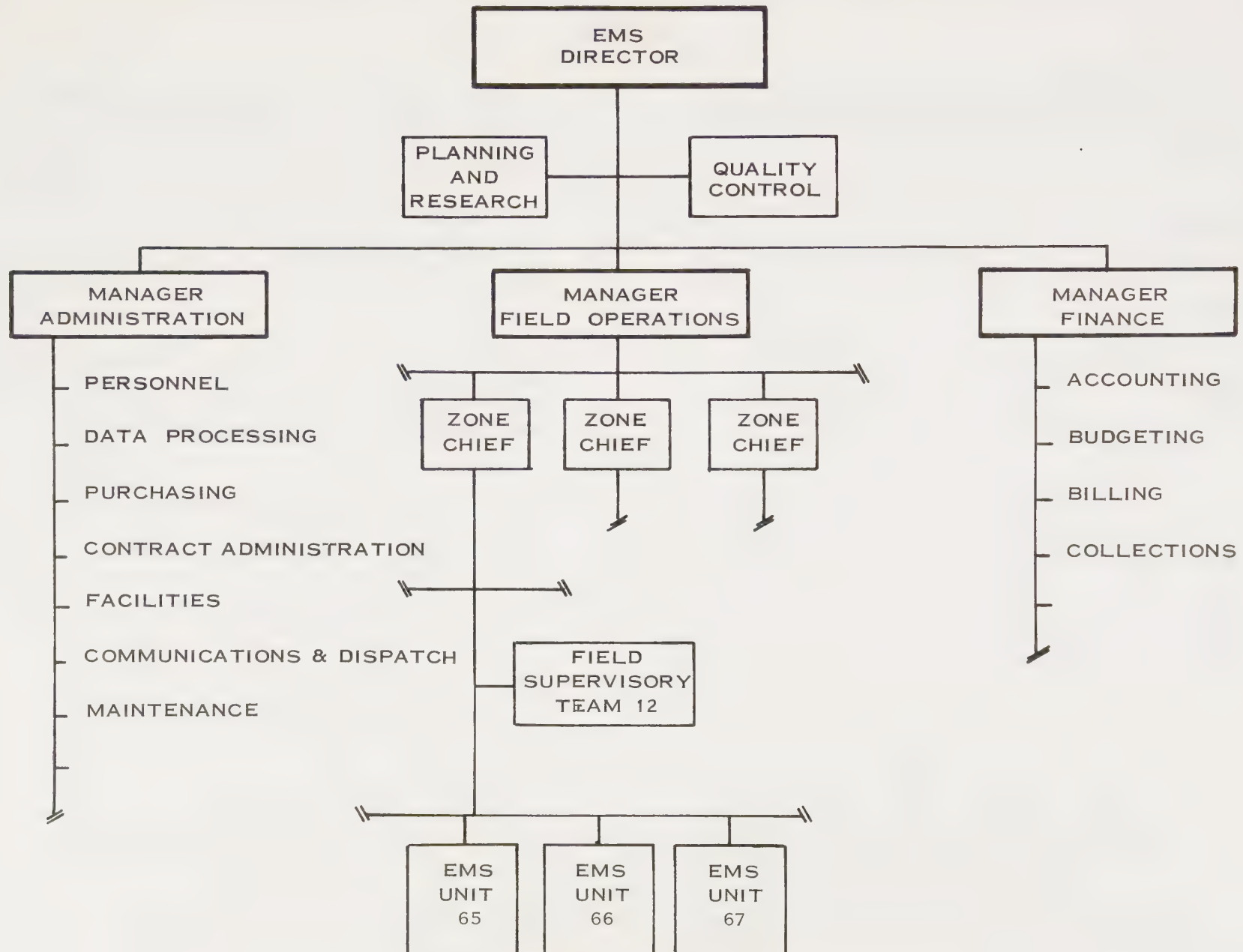
- Conditions under which the County Fire Department should transport should be clearly defined. In an urban area with nearby emergency hospitals a transport may not significantly increase the time that a squad is out of service. A squad in a rural area, however, may seriously impair its ability to respond to another incident if it were to transport a patient to a remote hospital location. In this case a private ambulance should probably be used for transport.
- Depending upon the volume of transports made by the County Fire Department, private ambulance companies could lose between \$700,000 and \$1,750,000 in revenue each year. This revenue loss would impact the financial viability of many of the companies and reduce county-wide backup resources.
- A charge for service is necessary to provide the net cost savings. It may not be feasible to implement a charge for patient transportation with restrictions of the existing agreement of the Consolidated Fire Protection Districts.

RECOMMENDATION

The County Fire Department should acquire patient transport capability. Prior to this

change the County, with input from the Fire Department and other appropriate agencies, should determine the conditions under which the Fire Department should transport, the maximum acceptable impact on the private ambulance industry, and whether a charge may be instituted in incorporated areas and the proper disposition of the revenue generated by such a change.

ORGANIZATION OF MAJOR FUNCTIONAL AREAS



PROPOSED ORGANIZATIONAL ROLES

THE DIRECTOR OF THE UNIFORM SYSTEM SHOULD BE RESPONSIBLE FOR THE MANAGEMENT AND CONTROL OF THE SYSTEM AND HAVE THREE FUNCTIONAL MANAGERS REPORTING TO HIM AS WELL AS TWO STAFF GROUPS TO PROVIDE SPECIALIZED ASSISTANCE.

PLANNING AND RESEARCH: SHOULD CONDUCT DEMAND ANALYSIS AND RESOURCE ALLOCATION STUDIES AND EVALUATE PERFORMANCE INDICATORS SUCH AS RESPONSE AND SERVICE TIMES.

QUALITY CONTROL: SHOULD MONITOR THE QUALITY OF FIELD PERFORMANCE, INVESTIGATE CITIZEN COMPLAINTS, AND INTERFACE WITH THE DEPARTMENT OF HEALTH SERVICES, THE EMERGENCY MEDICAL CARE COMMITTEE AND THE PARAMEDIC COMMISSION.

MANAGER OF ADMINISTRATION: SHOULD HAVE THE RESPONSIBILITY FOR ALL GENERAL HEADQUARTERS FUNCTIONS, INCLUDING COMMUNICATIONS AND DISPATCHING, MAINTENANCE, DATA PROCESSING, AND CONTRACT ADMINISTRATION. THE EXACT STRUCTURE OF THE FUNCTIONS REPORTING TO THE MANAGER WOULD BE DEPENDENT UPON:

- THE SIZE OF THE ORGANIZATION
- THE PLACEMENT OF ADMINISTRATIVE PERSONNEL AND DATA PROCESSING SERVICES INTERNALLY OR EXTERNALLY
- THE EXTENT OF CENTRALIZED DISPATCHING
- THE RELATIONSHIP OF THE UNIFORM SYSTEM TO OTHER COUNTY ORGANIZATIONS

MANAGER OF FIELD OPERATIONS: SHOULD HAVE THE RESPONSIBILITY FOR FIELD EMS OPERATIONS. THE MANAGER WOULD DELEGATE DAY-TO-DAY CONTROL OF THE

(CONTINUED)

FIELD UNITS TO ZONE CHIEFS IN CHARGE OF THE MANAGEMENT AND ADMINISTRATIVE ACTIVITIES NECESSARY TO KEEP THE FIELD UNITS FUNCTIONING. THIS WOULD INCLUDE SUCH MATTERS AS SCHEDULING, UNIT ASSIGNMENT, PERSONNEL ROTATION, AND DISCIPLINARY PROBLEMS. THE ZONE CHIEFS SHOULD HAVE FIELD SUPERVISORY TEAMS COMPOSED OF SENIOR PARAMEDICS WHO WORK FOR EACH CHIEF AND WHOSE DUTIES WOULD INCLUDE:

RESPONDING TO SCENES WHEN REQUESTED BY THE FIELD TEAMS TO ASSIST IN UNUSUAL OR PROBLEM CASES

RESPONDING TO CALLS FOR SERVICE WHICH INVOLVE ANOTHER AGENCY

REVIEWING ACTUAL EMERGENCY INCIDENTS IN THE FIELD ON AN UNSCHEDULED BASIS

EVALUATING PERFORMANCE OF FIELD TEAMS AS PART OF ONGOING TRAINING ACTIVITIES

THE EMS UNITS SHOULD WORK DIRECTLY FOR THE ZONE CHIEFS AND, DEPENDING UPON COST AND VOLUME CONSIDERATIONS AND THE ORGANIZATION'S ROLE IN THE COUNTY, COULD BE EITHER:

- FULL-TIME UNITS STAFFED BY EMPLOYEES OF THE ORGANIZATION
- CONTRACTED PRIVATE AMBULANCE UNITS
- CONTRACTED FIRE DEPARTMENT ENGINE COMPANIES STAFFED WITH PARAMEDICS AND USED IN LOW VOLUME AREAS

MANAGER OF FINANCE: SHOULD HAVE THE RESPONSIBILITY FOR MATTERS RELATING TO FUNDING, BUDGETING,

(CONTINUED)

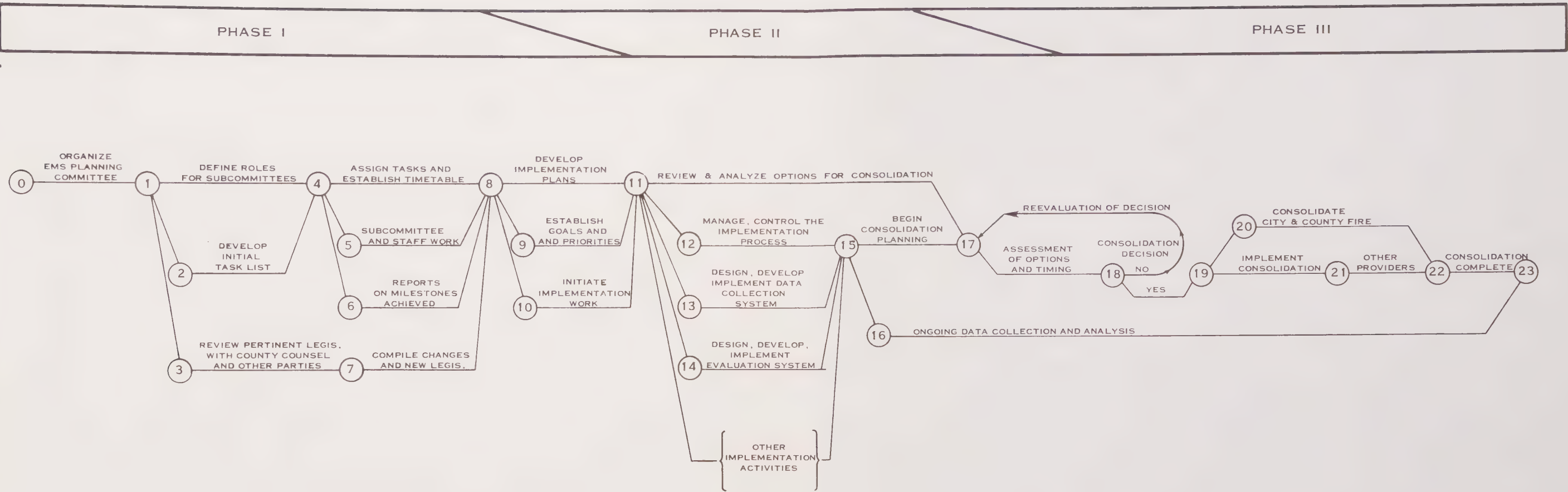
PROPOSED ORGANIZATIONAL ROLES

BILLING AND COLLECTIONS, AND FINANCIAL CONTROL AND PLANNING. THE EXTENT OF THE OPERATIONS OF THESE FUNCTIONS WOULD BE DETERMINED BY THE FUNDING ALTERNATIVE CHOSEN, THE DECISION TO BILL FOR SERVICES RENDERED, AND THE RELATIONSHIP OF THE UNIFORM SYSTEM TO OTHER ORGANIZATIONS.

GENERAL IMPLEMENTATION TIMETABLE

ACTIVITY	TIMING					
	1976	1977	1978	1979	1980	1981
ORGANIZE EMS PLANNING GROUP	—					
DEVELOP IMPLEMENTATION TIMETABLE AND TASKS LIST	—	—				
REVIEW, MODIFY, AND/OR REPLACE EXISTING LEGISLATION	—	—				
DEVELOP AND IMPLEMENT NEW STANDARDS AND PROCEDURES FOR EMS ADMINISTRATION AND PROVIDER OPERATIONS		—	—			
REVISE AND MODIFY		—	—			
. EAP		—	—			
. INTERFACILITY TRANSPORTS		—	—			
. PRIVATE AMBULANCE CONTRACTS		—	—			
DESIGN, DEVELOP, AND IMPLEMENT NEW DATA COLLECTION, MANAGEMENT INFORMATION AND EVALUATION SYSTEMS		—	—	—		
DEVELOP AND IMPLEMENT NEW FIELD SUPERVISION, QUALITY CONTROL, AND ADMINISTRATIVE FUNCTIONS		—	—	—		
IMPLEMENT CHANGES TO FIELD OPERATIONS		—	—	—		
. VARIABLE STAFFING		—	—	—		
. CALL SCREENING		—	—	—		
. TRANSPORT VEHICLES		—	—	—		
COUNTYWIDE EMS AGENCY			—	—	—	—
. PLANNING AND EVALUATION ACTIVITIES			—	—	—	—
. IMPLEMENTATION ACTIVITIES			—	—	—	—

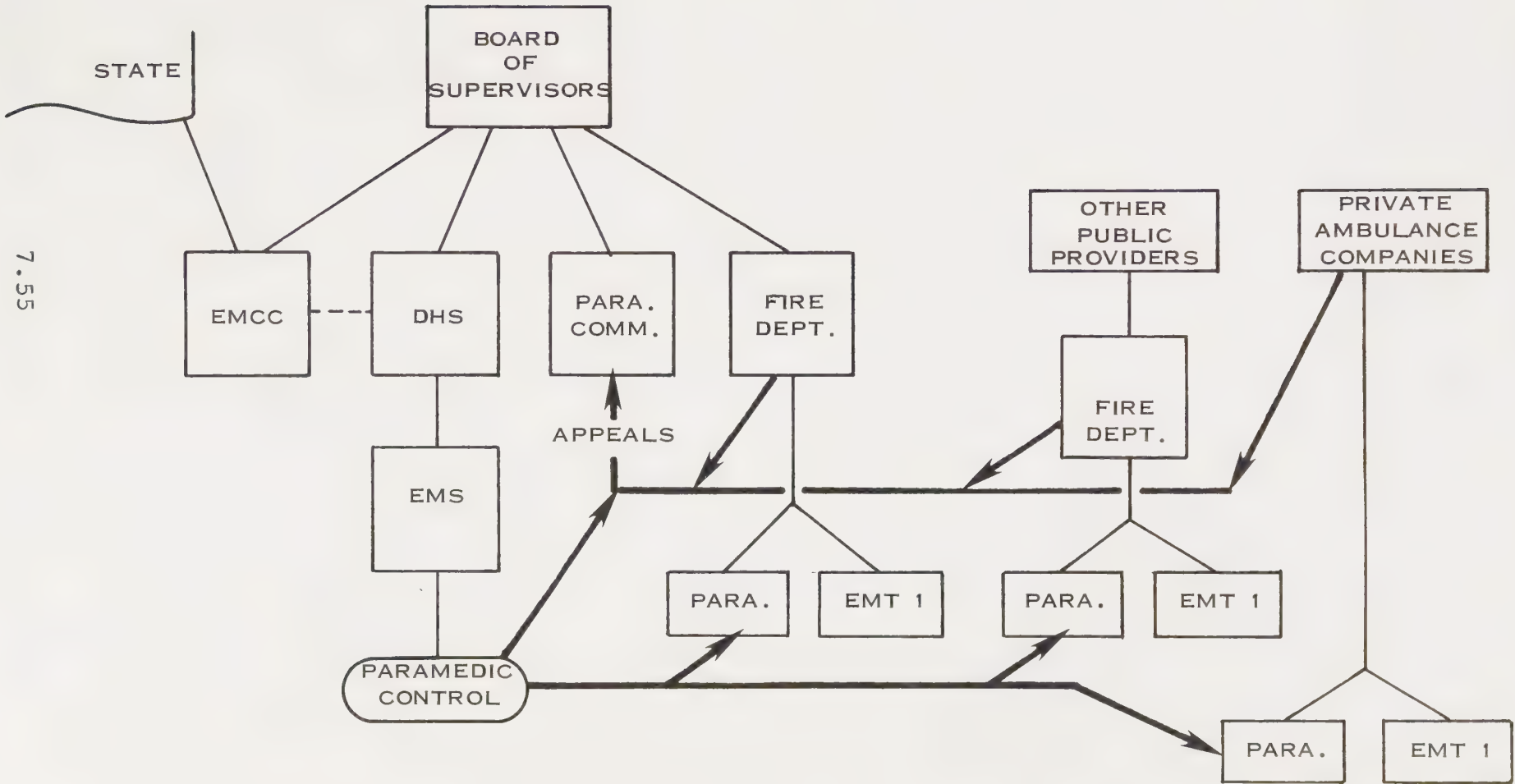
GENERAL IMPLEMENTATION WORKPLAN



TO

GENERAL IMPLEMENTATION WORKPLAN

ACTUAL CONTROL OF PROVIDER OPERATIONS



RESCUE REPORT

BILLING INFORMATION

EMPLOYER NAME _____ OCCUPATION _____

EMPLOYER ADDRESS _____

NEXT _____

OF KIN NAME & RELAT _____

OR _____

RESP _____

ADULT ADDRESS _____

Signature _____

EXTRICAT 1.64	MEDI CATION	T Y P E	A M T	B Y	T Y P E	A M T	B Y
RADIO ADV 1.65		I V F L U I D S	A M T	B Y	T Y P E	A M T	B Y
TELEMETRY 1.66		T Y P E	A M T	B Y	T Y P E	A M T	B Y

HISTORY AND REMARKS:

ADVISING
PHYSIC.

7.56

EAP SAVINGS FOR REIMBURSEMENT
AT LESS THAN FULL RATES

ESTIMATED

TOTAL REIMBURSEMENT (FISCAL YEAR 1975)

INPATIENT	\$1,305,009
OUTPATIENT	<u>1,812,842</u>
TOTAL	<u>\$3,117,851</u>

ASSUMPTIONS

INPATIENT SERVICES COULD BE REIMBURSED AT THE HOSPITAL'S MEDI-CAL COST SETTLEMENT PERCENTAGE, AND OUTPATIENT SERVICES COULD BE REIMBURSED ON THE BASIS OF THE CURRENT SCHEDULE OF MAXIMUM REIMBURSEMENT

POTENTIAL SAVINGS

COST SAVINGS DUE TO INPATIENT
REIMBURSEMENT COSTS RATHER
THAN CHARGES

$$(12\% \text{ DISCOUNT}) \times \$1,305,009 = \$156,601$$

COST SAVINGS DUE TO OUTPATIENT
REIMBURSEMENT AT SMR RATES

$$(20\% \text{ DISCOUNT}) \times \$1,812,842 = \underline{362,568}$$

$$\text{TOTAL POTENTIAL SAVINGS} \quad \underline{\underline{\$519,169}}$$

EAP MEDI-CAL BILLING ANALYSIS

BACKGROUND DATA

DURING 1975 THE COUNTY REIMBURSED HOSPITALS FOR 32,309 PATIENTS¹
AVERAGE REIMBURSEMENT WAS \$80.50 PER PATIENT²

ASSUMPTION

40% OF THESE PATIENTS ARE MEDI-CAL ELIGIBLE OR BECOME ELIGIBLE
WHILE AT THE COUNTY FACILITY

POTENTIAL SAVINGS

PATIENTS	X	CHARGE	X	MEDI-CAL PATIENT PERCENTAGE	=	SAVINGS
32,309	X	\$80.50	X	40%	=	\$1,040,350

¹ UNAUDITED FIGURE FOR FISCAL 1974-75 OBTAINED FROM THE OFFICE OF OUTSIDE MEDICAL RELIEF ("OMR").

² THIS FIGURE REPRESENTS THE AVERAGE BILLING AMOUNT FOR FISCAL 1974-75, OF \$96.50, DISCOUNTED 16.6% BASED ON COST RELATED HOSPITAL REIMBURSEMENT RATES. BILLING AMOUNTS WERE OBTAINED FROM OMR AND WERE NOT AUDITED.

LOS ANGELES COUNTY FIRE DEPARTMENT
TRANSPORT COST IMPACT

ESTIMATED
 \$000's OMITTED

	LOW VOLUME			HIGH VOLUME		
	<u>DIRECT</u>	<u>ALLOCATED</u>	<u>MFA</u>	<u>DIRECT</u>	<u>ALLOCATED</u>	<u>MFA</u>
CURRENT COST (1975)	\$1,386	\$5,255	\$7,412	\$ 1,386	\$5,255	\$7,412
ADDITIONAL VEHICLE EXPENSE	115	115	115	121	121	121
ADDED WORKLOAD						
BILLING	100	100	100	100	100	100
PERSONNEL	-	100	100	-	300	300
OVERHEAD	-	-	28	-	-	80
EAP SAVINGS ¹	(300)	(300)	(300)	(750)	(750)	(750)
REVENUES FROM BILLING ¹	(500)	(500)	(500)	(760)	(760)	(760)
NET REVISED COST	\$ 801	\$4,770	\$6,955	\$ 97	\$ 4,266	\$6,503
COST IMPACT	\$ (585)	\$ (485)	\$ (457)	\$ (1,289)	\$ (989)	\$ (909)

¹ REFLECTS BOTH THOSE AMOUNTS FROM INCIDENTS OCCURRING IN UNINCORPORATED AREAS AND IN CITIES SERVED BY THE CONSOLIDATED FIRE PROTECTION DISTRICTS.

7.59



C123318956

